PLAN OF OPERATIONS
AND
RECLAMATION PLAN

FOR

MITSUBISHI CEMENT CORPORATION'S
SOUTH QUARRY

Submitted to:

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
SAN BERNARDINO NATIONAL FOREST
602 S. Tippecanoe Avenue
San Bernardino, CA 92408

COUNTY OF SAN BERNARDINO
Land Use Services Department
Planning Division
385 N. Arrowhead Avenue
San Bernardino, CA 92415

Prepared by:

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JULY 2011
Revised January 2012

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MITSUBISHI CEMENT CORPORATION
PLAN OF OPERATIONS AND RECLAMATION PLAN
FOR THE SOUTH QUARRY

EXECUTIVE SUMMARY

1.0 INTRODUCTION

Mitsubishi Cement Corporation (MCC) is proposing to develop and reclaim a new high grade limestone quarry, the South Quarry, to the south of its East Pit (existing), West Pit (under development) and in proximity to the Cushenbury Cement Plant. The South Quarry will total approximately 153.6 acres consisting of a 128-acre quarry, a 2.7 acre landscape berm, a 22.2-acre, 1.8-mile haul road and a temporary construction road of 0.7 acres. The South Quarry and haul road will be located almost entirely (147 acres) on 440 acres of unpatented claims owned by MCC on public federal land under the jurisdiction of the San Bernardino National Forest (SBNF) with approximately 6.6 acres of the haul road located on MCC owned land where it enters the existing East Pit. The South Quarry is located adjacent to existing MCC facilities approximately 6 miles south of the community of Lucerne Valley in San Bernardino County, California.

2.0 HISTORY

Mining has been an important part of Lucerne Valley for more than 100 years. The Cushenbury area has been mined since 1861, and limestone mining began in the early 1950s. In 1988, MCC acquired the Cushenbury Cement Plant and the existing East Pit. Since that time, it has continued developing this important local source of limestone and producing a regional source of cement from the Cushenbury Cement Plant. Continued limestone mining in the Cushenbury area is the most efficient and environmentally responsible way for the Cushenbury Cement Plant to continue supplying these markets in the future.

MCC's existing operations are a source of local jobs and purchasing. Additionally, MCC's Cushenbury operations contribute to a stable domestic supply of cement. The cement produced at the Cushenbury plant has been used to meet local Southern California and Southern Nevada building and infrastructure needs. Notable projects using MCC cement include: the Ontario Airport expansion; the new Hoover Dam bridge; Ronald Reagan Federal Courthouse; the Ritz Carlton Hotel Resort; McCarran International Airport, Wynn Hotel & Casino and the MGM Grand Hotel.

Over the course of its operations at the Cushenbury site, MCC has sought to be a responsible company that is cognizant of the needs of its surrounding community. To that end, it has invested in projects intended to improve and protect the local environment. MCC established an electric vehicle fleet and retrofitted haul trucks with cleaner-burning engines. MCC was a founding member of the Cement Industry Environmental Consortium, the Mojave Environmental Education Consortium, and the Mojave Sustainability Project, which works with

Victor Valley College and others on restoration, re-vegetation and habitat enhancement. MCC also provides numerous public and educational tours for groups from elementary school students to visiting scientists each year.

In recognition of these and other efforts, MCC has received awards from state and local agencies, industry associations and Victor Valley College. In 1997, MCC received its first Exemplar Award from the Mojave Desert Air Quality Management District (MDAQMD) for its pollution prevention efforts. In 2000, it received a second MDAQMD Exemplar Award in recognition of its establishment of an electric vehicle fleet and its retrofitting of haul trucks with cleaner-burning engines. MCC won additional Exemplar Awards in 2004 and 2007. MCC was also selected as a recipient of one of the first annual Cement Industry Environmental Awards in 2001. One of five inaugural honorees, MCC received the Land Stewardship Award, and was recognized for its care of land in and near plant property; its efforts to maintain and restore native plant and animal life; and its program to ensure protection of adjacent wetlands. In 2002, MCC was recognized by the County of San Bernardino for the same land stewardship achievements. In 2003, MCC won a second Cement Industry Environmental Award for energy efficiency. In 2006, it won a Global Cement Award for its Environmental Program. In 2008, MCC was recognized by the County again, receiving an Outstanding Business Award. MCC was a finalist for the Portland Cement Association's 2008 National Environmental Outreach Award in 2009. Victor Valley College honored MCC executives with its Distinguished Service Award in 2005 and 2008.

3.0 WEST PIT APPROVAL

A major step in forecasting operations to meet regional construction materials needs began about 1999 with planning to identify a source of limestone to replace diminishing reserves in the East Pit. Following several years of careful analysis and regulatory scrutiny, permits for a new quarry, the West Pit, were approved in 2004. The West Pit is currently under development.

The West Pit required approval of a Reclamation Plan by the County of San Bernardino and associated California Environmental Quality Act (CEQA) review. Over the course of the approval process, MCC and its consultants made efforts to facilitate an open dialogue and encourage community participation. Furthermore, via the CEQA process various mitigation measures were incorporated into the West Pit project. As examples, MCC set aside land for the protection of the local herd of Nelson's bighorn sheep, agreed to create new water sources aimed at helping the population thrive and committed funds to collaring efforts intended to help the California Department of Fish and Game (CDFG) better understand the habits and needs of the local population, so that it might best be protected. MCC also set aside land for the protection of five sensitive carbonate plant species native to the region and were active in the development of the Carbonate Habitation Management Strategy (the CHMS), a regional planning effort aimed at protecting the same. A number of additional measures addressed issues including, but not limited to, traffic, air quality and water quality.

4.0 SOUTH QUARRY

Geologic reconnaissance during completion of final plans for the West Pit confirmed the projected supply of low-grade limestone but also identified a shortage of the anticipated high-grade material needed for long-term cement production. MCC initiated a comprehensive survey of properties in proximity to existing operations in an effort to identify high-grade limestone sources. In addition to relying on the traditional exploration approaches of historic data and geologic inference, MCC conducted a sophisticated drilling program of target properties. Helicopter transit delivered drilling rigs to inaccessible areas. Targeted drilling and analysis of samples retrieved during the program confirmed both quality and quantity of the high-grade resource in the location of the proposed South Quarry. Planning identified the most effective and efficient means to continue Cushenbury Cement Plant operations with a combination of low-grade material from the West Pit and the high-grade material resource identified in the proposed South Quarry.

MCC is proposing the South Quarry to develop reserves of more than 156 million tons of mostly high to medium grade limestone. As discussed above, this higher-grade limestone will be blended with lower-grade limestone excavated from the existing East Pit and the West Pit at a ratio of approximately 50/50 in order to meet the limestone specifications necessary to feed the Cushenbury Cement Plant. Current estimates project the South Quarry could feed the cement plant for approximately 120 years. MCC is pursuing permits for that 120-year period to provide certainty for blending material excavated at the East and West Pits consistent with the rate of production anticipated in the West Pit approvals.

Because the South Quarry will be located primarily on land controlled by SBNF, permitting will require compliance with both United States Forest Service Minerals Regulations under the jurisdiction of the SBNF and the State of California Surface Mining and Reclamation Act (SMARA) implemented by the County of San Bernardino (County). Therefore, in consultation with both the SBNF and the County, MCC is submitting a Plan of Operations for Mining Activities on National Forest System Lands, and a Reclamation Plan per the County's Mine and Reclamation Plan, Information Sheet and Application. Obtaining the necessary SBNF and County approvals will require compliance with both the National Environmental Policy Act ("NEPA") and CEQA.

The proposed South Quarry minimizes surface impacts by excavating deeper into the limestone deposit. After the first 40 years of mining, an additional 80 years of limestone can be extracted without expanding the mine's footprint or impacting additional natural habitat. In addition to limiting surface disturbance, the South Quarry has been designed to: (1) reduce open views of the quarry from the northeast and the east; (2) ensure slope reduction, stockpile management, erosion control, revegetation and other reclamation activities occur concurrent with mining, to the extent feasible; and (3) limit air quality impacts.

Because the South Quarry will not increase throughput at the Cushenbury Cement Plant, there will be no increase in traffic. Furthermore, consistent with its past environmental commitments,

MCC proposes mitigation measures that will further facilitate consistency with the project objectives. These mitigation measures include, but are not limited to the following:

- The set-aside of lands to compensate for impacts to sensitive carbonate endemic plants;
- Measures meant to expand on the programs initiated during the West Pit approval process and minimize potential impacts to the Cushenbury herd of Nelson's big-horn sheep;
- Site development and reclamation procedures intended to limit views of the South Quarry from the surrounding area; and
- Comprehensive approaches to revegetation and reclamation for the East Pit, West Pit and the South Quarry.

MCC believes the South Quarry is the next step in the responsible development of this important regional source of cement. The South Quarry will ensure long term predictability with respect to employment and purchasing for the local community, regional and local supplies of vital building materials and a domestic source of cement to address concerns related to supply and pricing. Development of the South Quarry maintains limestone production in the same general location with the fewest possible impacts. Proximity of the South Quarry to existing operations prevents additional environmental impacts that would be caused by development of an off-site source of material and truck traffic associated with moving off-site material to the Cushenbury Cement Plant. MCC proposes the South Quarry as the best way to ensure responsible development of an important limestone resource for continued long-term production from an equally important local cement industry.

USDA, Forest Service

PLAN OF OPERATIONS FOR MINING ACTIVITIES ON NATIONAL FOREST SYSTEM LANDS

FS-2800-5
OMB NO. 0596-0022

USE OF THIS FORM IS OPTIONAL! **1st TIME USERS SHOULD DIRECT QUESTIONS REGARDING THIS FORM OR REGULATIONS (36 CFR 228A) TO THE FOREST SERVICE DISTRICT OFFICE NEAREST YOUR AREA OF INTEREST.**

Submitted by:		**Mine Superintendent**	
	Signature	Title	Date *(mm/dd/yy)*
Plan Received by:			
	Signature	Title	Date *(mm/dd/yy)*

I. GENERAL INFORMATION

A. Name of Mine/Project: **Mitsubishi Cement Corporation/South Quarry**

B. Type of Operation: **Mining**
(lode, placer, mill, exploration, development, production, other)

C. Is this a (☒new/☐continuing) operation? (check one). If continuing a previous operation, this plan (☐replaces/☐modifies/☐supplements) a previous plan of operations. (check one)

D. Proposed start-up date *(mm/dd/yy)* of operation: **1/1/2012**

E. Expected total duration of this operation: **120 years of operations followed by 5 years of reclamation activities**

F. If seasonal, expected date *(mm/dd/yy)* of annual reclamation/stabilization close out: **N/A**

G Expected date *(mm/dd/yy)* for completion of all required reclamation: **12/31/2136 (followed by ongoing monitoring)**

II. PRINCIPALS

A. Name, address and phone number of operator:
Mitsubishi Cement Corporation
5808 State Hwy 18
Lucerne Valley, CA 92356
Austin Marshall, Mine Superintendent (760) 248-7373

B. Name, address, and phone number of authorized field representative (if other than the operator).
Attach authorization to act on behalf of operator. Same as A above.

C. Name, address and phone number of owners of the claims (if different than the operator):

Same as A above.

D. Name, address and phone number of any other lessees, assigns, agents, etc., and briefly describe their involvement with the operation, if applicable:

Not Applicable

III. PROPERTY OR AREA

Name of claim, if applicable, and the legal land description where the operation will be located. **See attached Claims List in Appendix B for a complete description.**

MC#	*Name*	*Section*	*Township*	*Range*
26128	**Cushenbury 17 – 150 acres**	**14**	**3N**	**1E**
26133	**Cushenbury 28 – 60 acres**	**15**	**3N**	**1E**
26182	**Cushenbury 82 – 20 acres**	**23**	**3N**	**1E**
26183	**Cushenbury 83 – 20 acres**	**23**	**3N**	**1E**
26184	**Cushenbury 84 – 20 acres**	**23**	**3N**	**1E**
237601	**Cushenbury 99 – 20 acres**	**22**	**3N**	**1E**
237602	**Cushenbury 100 - 20 acres**	**22**	**3N**	**1E**
258070	**Cushenbury 101 – 20 acres**	**15**	**3N**	**1E**
264488	**Cushenbury 103 – 10 acres**	**14**	**3N**	**1E**
264489	**Cushenbury 104 – 10 acres**	**15**	**3N**	**1E**
264490	**Cushenbury 105 – 10 acres**	**15**	**3N**	**1E**
264491	**Cushenbury 106 – 20 acres**	**15**	**3N**	**1E**
264492	**Cushenbury 107 – 20 acres**	**15**	**3N**	**1E**
264493	**Cushenbury 108 – 20 acres**	**15**	**3N**	**1E**
264494	**Cushenbury 109 – 20 acres**	**15**	**3N**	**1E**

IV. DESCRIPTION OF THE OPERATION

A. **Access.** Show on a map (USGS quadrangle map or a National Forest map, for example) the claim boundaries, if applicable, and all access needs such as roads and trails, on and off the claim. Specify which Forest Service roads will be used, where maintenance or reconstruction is proposed, and where new construction is necessary. For new construction, include construction specifications such as widths, grades, etc., location and size of culverts, describe maintenance plans, and the type and size of vehicles and equipment that will use the access routes.

Please refer to Figure 1 – Regional Location Map; Figure 2 – Project Vicinity; Figure 3 – Existing and Planned Operations (including claims boundaries); and Figure 4 – Extent of Holdings including claims boundaries.

Access and haul roads are shown on the Mine and Reclamation Plan Sheets 1 through 4.

During the first 2 years, the 1.8-mile long haul road will be constructed. The planned haul road will access the South Quarry at 5,950 feet amsl and traverse down the north slope to an elevation of 5,050 feet amsl at the southwest corner of the existing East Pit. The road's surface width including drainage and side berm will be approximately 60 feet with a grade not to exceed 10% and it will have a surface of crushed limestone (see Figure 6 and Sheet 2). The preliminary road design has estimated a cut of approximately 450,000 cubic yards (CY) and based on 1 horizontal:1 vertical (1H:1V) slopes required to develop the road. The estimated disturbance area of the proposed haul road is 22.2 acres of which 6.6 acres is on MCC fee land and 15.6 acres on SBNF land.

B. **Map, Sketch or Drawing.** Show location and layout of the area of operation. Identify any streams, creeks or springs if known. Show the size and kind of all surface disturbances such as trenches, pits, settling ponds, stream channels and run-off diversions, waste dumps, drill pads, timber disposal or clearance, etc. Include sizes, capacities, acreage, amounts, locations, materials involved, etc.

Please refer to attached Mine and Reclamation Plan Sheets 1 through 4.

A Jurisdictional Delineation of surrounding drainage features is included in Appendix H.

C. **Project Description.** Describe all aspects of the operation including mining, milling, and exploration methods, materials, equipment, workforce, construction and operation schedule, power requirements, how clearing will be accomplished, topsoil stockpile, waste rock placement, tailings disposal, proposed number of drill holes and depth, depth of proposed suction dredging, and how gravels will be replaced, etc. Calculate production rates of ore. Include justification and calculations for settling pond capacities, and the size of runoff diversion channels.

Mitsubishi Cement Corporation (MCC) is proposing to develop and reclaim a new high grade limestone quarry to the south of its East Pit (existing), West Pit (under development), and the Cushenbury Cement Plant. The proposed quarry is designated as the South Quarry and is located approximately 6 miles south of the community of Lucerne Valley in San Bernardino County, California (see Figures 1 and 2). The South Quarry will total approximately 153.6 acres consisting of a 128-acre quarry, a 2.7 acre landscape berm, a 22.2-acre haul road 1.8 miles in length, and a temporary construction road of 0.7 acres. The South Quarry and haul road will be located almost entirely (147.0 acres) on 440 acres of unpatented claims owned by MCC on public federal land under the jurisdiction of the San Bernardino National Forest (SBNF) with approximately 6.6 acres of the haul road located on MCC fee land where it enters the existing East Pit (see Figure 3).

A complete Project Description is included in the following Section 1.0. The proposed South Quarry is a mining operation only (no milling or processing onsite) that will supply high grade limestone to the Cushenbury Cement Plant. The excavations planned including the area, phasing, slopes, and depth are discussed in Section 1.1. The ore will be transported to the existing primary crusher adjacent to the existing East Pit via a new haul road discussed above and in Section 1.1. Proposed production phases, rates and reserves are listed in Table NF1 below.

Table NF1
Planned Quarry Phasing and Production
South Quarry

PHASE	Area (acres)	Volume (millions of cubic yards)	Weight (millions of tons)	Ore Reserves (millions of tons)	Waste Rock (millions of tons)	Max. Depth (feet amsl)	Years of Operations
1A	11	2.3	5.1	4.5	0.5	5,860	3.5
1B	32	14.6	32.1	28.8	3.2	6,130	22.0
2	85	9.6	21.0	18.8	2.2	6,220	14.5
3	(75)[1]	26.4	58.0	52.0	6.0	5,905	40
4	(65)[1]	26.4	58.0	52.0	6.0	5,365	40
Totals	**128**	**79.3**	**174.0**	**156.0**	**18.0**	**5,365**	**120**

Notes: Source: MCC, Lilburn Corp. 2010
All volumes are estimated.
Area rounded to nearest acre. Totals may be slightly different due to rounding.
Millions of cubic yards and tons rounded to nearest tenth.
In-situ or in-place limestone rock weight to volume ratio estimated at 2.2 tons per 1 cubic yard.
Years of operations based on average production of 1.3 million tons per year for 120 years.
Waste rock estimated at 0.15 million tons per year or approximately 10% which will vary depending on area being excavated.
1 – Phases 3 and 4 areas excavated with depth within Phase 2 area previously disturbed.

Waste rock, defined as limestone and other rock not suitable for the manufacture of cement, will be stockpiled within the quarry footprint to eliminate the need for off-site waste rock stockpiles, reducing surface disturbance and potential visual and erosion impacts.

D. **Equipment and Vehicles.** Describe that which is proposed for use in your operation (Examples: drill, dozer, wash plant, mill, etc.). Include: sizes, capacity, frequency of use, etc.

The typical equipment list is included as Table NF2 below.

The quarry will normally operate approximately 250 days per year round, five days per week, 10 hours per day. Factors such as market conditions and maintenance requirements vary this schedule, occasionally necessitating a second shift or weekend work. In addition, due to the higher altitude of the site, the South Quarry operations may be suspended for one or two months during the winter due to snow.

Table NF2
Typical Quarry Equipment
South Quarry

Equipment	Typical Number	Net Increase of Additional Equipment	Purpose
Dozer	1 – 2	0	Removal of topsoil and waste rock. Construction and maintenance of the haul road.
Off-Road Haul Trucks	2 - 9	3	Transportation of material to the primary crusher and waste rock stockpiles onsite. Note that 2 trucks will be dedicated to the South Quarry and up to 7 trucks will rotate with the West Pit operations as needed.
Drill Rig	1	0	Drill holes for placement of explosives.
Water Trucks	1 – 2	0	Water haul roads, active excavation areas, stockpiles, and general dust suppression at site.
Front-End Loaders	2 - 3	0	Loading of materials into haul trucks at active mining area.

Source: MCC, 2010
Note that the typical number of pieces of equipment does not represent a net increase in equipment for the overall Cushenbury Mine area as most operations at the South Quarry will utilize existing equipment. The net increase of additional equipment is three new haul trucks.

E. **Structures.** Include information about fixed or portable structures or facilities planned for the operation. Show locations on the map. Include such things as living quarters, storage sheds, mill buildings, thickener tanks, fuel storage, powder magazines, pipelines, water diversions, trailers, sanitation facilities including sewage disposal, etc. Include engineering design and geotechnical information for Proposed Project facilities, justification and calculations for sizing of tanks, pipelines and water diversions, etc.

There are no structures proposed to be constructed onsite. The haul road construction will require drainage crossings which will be provided in the engineering phase prior to construction to the SBNF and the County.

Geotechnical assessment for the slope stability is included in Appendix C.

Sewage disposal will be handled by portable sanitation facilities.

V. ENVIRONMENTAL PROTECTION MEASURES (SEE 36 CFR 228.8)

A. **Air Quality.** Describe measures proposed to minimize impacts on air quality such as obtaining a burning permit for slash disposal or dust abatement on roads.

Dust control measures will include water spraying haul roads, active mining areas, and waste rock stockpiles.
Haul trucks and diesel equipment shall meet all requirements of the CARB's off-road diesel vehicles regulation to reduce diesel pollutants.

Compliance with MDAQMD Rules 401 (limiting visible emissions from exhaust); 402 (avoid nuisance emissions to people or businesses or property); 403 prohibits visible dust from crossing property lines); and 403.2 (requires requirements for controlling fugitive dust).

For additional information, an air quality assessment will be submitted separately.

B. **Water Quality.** State how applicable state and federal water quality standards will be met. Describe measures or management practices to be used to minimize water quality impacts and meet applicable standards.

1. State whether water is to be used in the operation, and describe the quantity, source, methods and design of diversions, storage, use, disposal, and treatment facilities. Include assumptions for sizing water conveyance or storage facilities.

2. Describe methods to control erosion and surface water runoff from all disturbed areas, including waste and tailings dumps.

3. Describe proposed surface water and groundwater quality monitoring, if required, to demonstrate compliance with federal or state water quality standards.

4. Describe the measures to be used to minimize potential water quality impacts during seasonal closures, or for a temporary cessation of operations.

5. If land application is proposed for waste water disposal, the location and operation of the land application system must be described. Also describe how vegetation, soil, and surface and groundwater quality will be protected if land application is used.

1. Water will be used for road and mine dust control and will be obtained from existing water wells on MCC fee land (not SBNF land). There will be no added diversions or storage for water supply. No treatment facilities will be needed. Water will be hauled in a water truck (Cat 773 or Euclid R-50 typical with 13,000 gallon capacity) and sprayed on the haul roads and active mining area to minimize fugitive dust. The water truck will work continuously during active quarry operations as needed to control visible dust. Typically, the water truck will make eight trips/day and the estimated average usage will be approximately 104,000 gallons/day. This water will evaporate and therefore, the Proposed Project will not produce any wastewater or run-off.

2. Methods to control erosion are discussed in Section 1.5.

3 & 4. All operations on-site will comply with a National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges associated with industrial activities and employ storm water BMPs during construction, operations, and temporary cessation of operations. NPDES goals are to eliminate unauthorized non-storm water discharges and to monitor storm water discharges requirements. Any surface water monitoring would be through this requirement as needed.

5. Not applicable.

C. **Solid Wastes.** Describe the quantity and the physical and chemical characteristics of solid waste produced by the operation. Describe how the wastes will be disposed of including location and design of facilities, or treated so as to minimize adverse impacts.

No solid waste will be produced by the operations. Waste rock, defined as limestone which does not meet cement quality specifications, will be stockpiled within the quarry footprint to eliminate the need for off-site waste rock stockpiles, reducing surface disturbance and potential visual and erosion impacts. Following mining, waste rock stockpiles will reduce quarry slopes and will be revegetated.

D. **Scenic Values.** Describe protection of scenic values such as screening, slash disposal, or timely reclamation.

The quarry and haul road will be designed to reduce exposure; waste rock will be deposited within the quarry to reduce impact areas; a 20 to 25-foot high natural perimeter berm (half a vertical bench height) will be left in-place on the outside ridge until the interior area of the next lower excavation level is completed; a landscape berm will be constructed along the south rim; and reclamation and revegetation will be implemented concurrent with mining.

The development of internal waste rock stockpiles will reduce the area of disturbance outside the quarry rim, eliminating potential visual impacts of the waste rock piles that are typically highly visible, and reduce internal slopes to aid in revegetation.

Two visual simulations of the Proposed Project are included in Section 2.2 showing potential visual views of the site from the south in SBNF lands and from the north in Lucerne Valley. Potential impacts to scenic values will be assessed in the environmental document. A Scenic Report is included in Appendix J.

E. **Fish and Wildlife.** Describe measures to maintain and protect fisheries and wildlife, and their habitat (includes threatened, endangered, and sensitive species) affected by the operations.

MCC intends to be consistent with the CHMS and has proposed to mitigate impacts to these listed species through permanent conservation easements or other surface use restriction burdening unpatented mining claims at a compensation ratio of 3:1 in terms of "Conservation Value." MCC's carbonate plant mitigation proposal is included as Appendix O.

Prior to clearing and excavation, sensitive plants will be salvaged for future revegetation and study.

MCC will implement the following measures: design quarry to avoid upper Marble Canyon Creek and its sensitive lambing areas; restrict clearing during spring bird nesting season; provide agreed upon mitigation for protection of bighorn sheep; and compliance with applicable biological federal, state, and County regulations.

Potential biological impacts will be assessed and mitigation recommended within the environmental document. A Biological Resource Assessment conducted by Aspen Environmental Group is included in Appendix D. A biological assessment has also been performed by the U.S. Forest Service and will be submitted separately.

F. **Cultural Resources.** Describe measures for protecting known historic and archeological values, or new sites in the Proposed Project area.

Cultural resource surveys were conducted by SBNF (see Appendix M) and the environmental document will assess potential impacts and recommend mitigation measures if needed.

G. **Hazardous Substances.**

1. Identify the type and volume of all hazardous materials and toxic substances which will be used or generated in the operations including cyanide, solvents, petroleum products, mill, process and laboratory reagents.

No hazardous materials will be used or generated in the proposed operations except for the use of diesel fuel and lubricants for the mine equipment. Best Management Practices (BMPs) will be applied during re-fueling and maintenance of the mine equipment which will be undertaken by mobile maintenance trucks and fuel trucks. The equipment will be moved to the main plant area shops for major maintenance or repairs.

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2. For each material or substance, describe the methods, volume, and frequency of transport (include type of containers and vehicles), procedures for use of materials or substances, methods, volume, and containers for disposal of materials and substances, security (fencing), identification (signing/labeling), or other special operations requirements necessary to conduct the proposed operations.

Diesel fuel and lubricants will be transported to onsite equipment by off-road maintenance and fuel trucks that will be in compliance with applicable federal, state and local regulations related to the transport and transferring of fuels.

3. Describe the measures to be taken for release of a reportable quantity of a hazardous material or the release of a toxic substance. This includes plans for spill prevention, containment, notification, and cleanup.

The Hazardous Materials Division of the San Bernardino County Fire Department is designated as the Certified Unified Program Agency or "CUPA" for the County of San Bernardino in order to focus the management of specific environmental programs at the local government level. MCC will update its current Business Emergency/ Contingency Plan to include operations for the South Quarry. The Business Plan includes a hazardous materials inventory and Spill Prevention Control and Countermeasure Plan (SPCC). The Plans will be provided to the SBNF prior to project start-up.

H. **Reclamation.** Describe the annual and final reclamation standards based on the anticipated schedule for construction, operations, and Project closure. Include such items as the removal of structures and facilities including bridges and culverts, a revegetation plan, permanent containment of mine tailings, waste, or sludge which pose a threat of a release into the environment, closing ponds and eliminating standing water, a final surface shaping plan, and post operations monitoring and maintenance plans.

Reclamation and revegetation are discussed in detail in Sections 2.5 and 2.6.

VI. FOREST SERVICE EVALUATION OF PLAN OF OPERATIONS

A. Required changes/modifications/special mitigation for plan of operations:

B. **Bond.** Reclamation of all disturbances connected with this plan of operations is covered by Reclamation Performance Bond No. , dated *(mm/dd/yy)* , signed by (Principal) and (Surety), for the penal sum of .
This Reclamation Performance Bond is a guarantee of faithful performance with the terms and conditions listed below, and with the reclamation requirements agreed upon in the plan of operations. This Reclamation Performance Bond also extends to and includes any unauthorized activities conducted in connection with this operation.

The bond amount for this Reclamation Performance Bond was based on a bond calculation worksheet. The bond amount may be adjusted during the term of this proposed plan of operations in response to changes in the operations or to changes in the economy. Both the Reclamation Performance Bond and the bond calculation worksheet are attached to and made part of this plan of operations.

Acceptable bond securities (subject to change) include:
1. Negotiable Treasury bills and notes which are unconditionally guaranteed as to both principle and interest in an amount equal at their par value to the penal sum of the bond; or
2. Certified or cashier's check, bank draft, Post Office money order, cash, assigned certificate of deposit, assigned savings account, blanket bond, or an irrevocable letter of credit equal to the penal sum of the bond.

VII. TERMS AND CONDITIONS

A. If a bond is required, it must be furnished before approval of the plan of operations.

B. Information provided with this plan marked confidential will be treated in accordance with the agency's laws, rules, and regulations.

C. Approval of this plan does not constitute certification of ownership to any person named herein and/or recognition of the validity of any mining claim named herein.

D. Approval of this plan does not relieve me of my responsibility to comply with other applicable state or federal laws, rules, or regulations.

E. If previously undiscovered cultural resources (historic or prehistoric objects, artifacts, or sites) are exposed as a result of operations, those operations will not proceed until notification is received from the Authorized Officer that provisions for mitigating unforeseen impacts as required by 36 CFR 228.4(e) and 36 CFR 800 have been complied with.

F. This plan of operations has been approved for a period of or until *(mm/dd/yy)*

. A new or revised plan must be submitted in accordance with 36 CFR part 228, subpart A, if operations are to be continued after that time period.

VIII. OPERATING PLAN ACCEPTANCE

☐I/☐We have reviewed and agreed to comply with all conditions in this plan of operations including the required changes, modifications, special mitigation, and reclamation requirements.

☐I/☐We understand that the bond will not be released until the Authorized Officer in charge gives written approval.

☐Operator (or ☐Authorized Representative)	(Date) *(mm/dd/yy)*

IX. OPERATING PLAN APPROVAL

(Name)	(Title)
(Authorized Officer)	(Date) *(mm/dd/yy)*

"According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB number. The valid OMB number for this information collection is 0596-0022. The time required to complete this information collection is estimated to average 8 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information."

MITSUBISHI CEMENT CORPORATION
PLAN OF OPERATIONS AND RECLAMATION PLAN
FOR THE SOUTH QUARRY

1.0 MINE PLAN

Introduction

Mitsubishi Cement Corporation (MCC) is proposing to develop and reclaim a new high grade limestone quarry to the south of its East Pit (existing), West Pit (under development), and the Cushenbury Cement Plant. The proposed quarry is designated as the South Quarry and is located approximately 6 miles south of the community of Lucerne Valley in San Bernardino County, California (see Figures 1 and 2). The South Quarry will total approximately 153.6 acres consisting of a 128-acre quarry, a 2.7 acre landscape berm, a 22.2-acre haul road 1.8 miles in length, and a temporary construction road of 0.7 acres. The South Quarry and haul road will be located almost entirely (147.0 acres) on 440 acres of unpatented claims owned by MCC on public federal land under the jurisdiction of the San Bernardino National Forest (SBNF) with approximately 6.6 acres of the haul road located on MCC fee land where it enters the existing East Pit (see Figure 3).

MCC is required to comply with both Forest Service Minerals Regulations (36 CFR 228, Subpart A) under the jurisdiction of the SBNF and the State of California Surface Mining and Reclamation Act (SMARA) implemented by the County of San Bernardino (County) (Development Code, Chapter 88.03). Therefore, in consultation with both the SBNF and the County, MCC is submitting a Plan of Operations for Mining Activities on National Forest System Lands (FS-2800-5) and a Reclamation Plan per the County's Mine and Reclamation Plan, Information Sheet and Application. Both of these forms and applications are combined in this document with four attached 30-inch by 40-inch, 200 scale mine and reclamation plan sheets and cross-sections.

The South Quarry is within portions of Sections 14, 15, 22, and 23 Township 3 North, Range 1 East. SBBM. The Cushenbury Cement Plant and related quarries are accessed directly from Highway 18 south of Lucerne Valley (refer to Figure 3). The extent of MCC's other adjacent holdings include approximately 990 acres of fee lands and 40 acres of unpatented claims (see Figure 4). The South Quarry site and the surrounding land uses consist of vacant public lands administered by the SBNF. MCC currently operates two quarries on fee land just north of the proposed South Quarry, the existing East Pit on 214 acres and the West Pit on 191 acres (under development), approved by the County in 2004.

Based on drilling conducted during the winter of 2009 and 2010, the South Quarry site has estimated proven and inferred reserves of over 200 million tons of mostly high to medium grade limestone. This higher grade limestone will be blended with lower grade limestone excavated from the West and East Pits at a ratio of approximately 50/50 in order to meet the limestone

Figure 1 Regional Map

Figure 2 Location Map

Figure 3 Existing Quarries and Planned Operations (Aerial)

Figure 4 Extent of Holdings (show FS boundaries)

specifications to feed the adjacent Cushenbury Cement Plant. The South Quarry will be mined at an average production rate of 1.3 million tons per year (MTPY) of ore and 150,000 tons per year of waste rock for up to 120 years. At this time, MCC is requesting a 120-year operations plan (through the year 2131) excavating approximately 156 MT of ore. MCC's Cushenbury Cement Plant requires a limestone feed of up approximately 2.6 MTPY, and this will not change as a result of the South Quarry Project. East and West Pits will be reduced to an average of 1.3 MTPY of ore and 150,000 tons per year of waste rock. Therefore the overall limestone production of 2.6 MTPY and 300,000 tons per year of waste rock at the mining complex will not change.

Specific reclamation activities will occur concurrent with excavations and throughout the life of the operations such as slope reduction, stockpile management, erosion control, and revegetation. At the conclusion of excavations, 5 years of active reclamation and revegetation will be implemented followed by revegetation monitoring and remediation until revegetation goals are achieved.

The ore will be transported by off-road haul trucks to the existing crushing and screening system at the adjacent Cushenbury Cement Plant for use in the production of cement. It is estimated that there will be approximately 150,000 tons per year or a total of approximately 18 million tons of waste rock excavated not suitable for the manufacture of cement. Note that annual waste rock production will vary based on the location of the excavations and the quality of the rock. Unlike other limestone mines in the area, the waste rock will be deposited within the quarry itself to fill or reduce slopes in Phases 1B, 2, and 3 and will not create any waste rock stockpiles outside the quarry. This will limit impacted areas to the quarry and haul road and eliminate potential visual, stability, and erosion impacts of a typical waste rock stockpiles.

The Plan proposes excavations to be undertaken in four phases with the development of the main quarry to a maximum depth of 5,365 feet above mean sea level (amsl) or 1,215 feet below the quarry rim on the south (see Figure 5). Elevations at the South Quarry site currently range from 5,555 to 6,675 feet amsl. The planned haul road will access the South Quarry at 5,950 feet amsl and traverse down the north slope for approximately 6,580 feet to an elevation of 5,050 feet amsl at the southwest corner of the existing East Pit. The South Quarry will be generally 1,800 feet northeast to southwest, and 3,600 feet northwest to southeast with an extension along the haul road of 1,450 feet to the northwest.

The phased mining, the haul road, landscape berm, and reclamation with cross-sections, slopes and contours are depicted on the four attached Mine Reclamation Plan sheets. This proposed Plan was developed with the following objectives:

- To develop a high grade limestone resource to blend with the West and East Pits' limestone to supply the required feed specifications for the adjacent Cushenbury Cement Plant for an extended period;
- To supply cement for construction and other uses in an efficient and environmentally sound manner;

Figure 5 Quarry Plot Plan (Sheet 2)

- To continue to realize the economic value from the investment made in the existing Cushenbury mine and cement plant and the limestone resource at the project site;
- To avoid logistical and environmental costs associated with non-contiguous operations;
- To meet the USFS regulations to cause no undue and unnecessary degradation;
- To meet the State's and County's Surface Mining and Reclamation Act (SMARA) requirements;
- To be consistent with the intent of the SBNF's Carbonate Habitat Management Strategy in order to provide long-term protection for the sensitive carbonate endemic plants through contribution of lands to the Carbonate Habitat Reserve;
- To minimize impacts to sensitive plants and wildlife including the Cushenbury herd of Nelson's bighorn sheep through quarry design and offsite mitigation;
- To reclaim the site for post-mining uses which will include open space habitat;
- To contour mining features and revegetate disturbed areas to minimize aesthetic and erosion impacts; and
- To reclaim and maintain the site as necessary to eliminate hazards to public safety.

Some of the benefits resulting from the expansion of mining operations adjacent to an existing operation and the cement plant include:

- The avoidance of habitat fragmentation that may result from supplying the existing Cushenbury Cement Plant with limestone mined from a carbonate area not adjacent to the existing cement plant; and
- The avoidance of increases to truck traffic on public roads and associated increases in air combustion and green house gas emissions, diesel fuel consumption, and road maintenance that may result from supplying the existing cement plant from other limestone mines.

Project Need

MCC's Cushenbury Cement Plant requires a limestone feed of approximately 2.6 MTPY of a specific blend of limestone in order to manufacture cement. In 2004, as the existing East Pit neared its exhaustion of cement grade limestone, the West Pit expansion was approved by the County of San Bernardino on 191 acres to the west of the existing East Pit with approximately 217 MT of limestone reserves. Based on subsequent limestone testing, the amount of high grade limestone to blend with the lower grades of limestone to meet the feed requirement for the cement plant will not be adequate for the life of the mine.

Therefore, MCC explored the surrounding area to determine if high grade deposits of limestone could be feasibly developed to augment the lower grade limestone from the developing West Pit. Based on drilling conducted during the winter of 2009 and 2010, the proposed South Quarry site will be able to meet this goal with its estimated proven and inferred reserves of over 200 million tons of high to medium grade limestone rock. This higher grade limestone will be blended with lower grade limestone excavated from the West and East Pits at a ratio of approximately 50/50 in order to meet the limestone specifications to feed the adjacent Cushenbury Cement Plant.

Operator: Mitsubishi Cement Corporation
5808 State Hwy 18
Lucerne Valley, CA 92356

Representative: Lilburn Corporation
1905 Business Center Drive
San Bernardino, California 92408

General Plan Designation: Resource Conservation

Estimated Operating Life: 120 years (January 1, 2012 through December 31, 2131)

Planned Production: average of 1.3 MTPY of limestone; average of 5,200 tons/day based on 250 days/year, 10 hours/day. Waste rock average of 0.15 MTPY; average of 600 tons/day.

Estimated Mining Termination Date: December 31, 2131

Estimated Reclamation Completion: December 31, 2136 followed by revegetation monitoring

Reclaimed End Use: Open space habitat with native vegetation

1.1 MINING OPERATIONS

MCC currently operates the Cushenbury East Pit (existing) and West Pit (under development) located north of the proposed South Quarry. The existing East Pit is nearing the end of its reserves and mining will shift to the West Pit (now under development) and the proposed South Quarry. The development of the South Quarry will consist of construction of the 1.8 mile long haul road, four phases of excavations, concurrent reclamation, and then final reclamation followed by revegetation monitoring. Sheet 2 shows the quarry design overlaid on the existing topography. Sheet 4 shows the quarry cross-sections. The final bench design is a 45-foot high face and 25-foot wide bench, with an overall final quarry slope angle of 60°.

Haul Road

Limestone ore excavated at the South Quarry will be hauled by off-road haul trucks to the existing primary crusher located at the north end of the existing East Pit. The haul trucks currently in the MCC fleet have capacities of 77 to 105 tons. Any haul trucks added as a result of the Project will be new, 105-ton capacity haul trucks. During the first two years, the 1.8-mile long haul road will be constructed. The planned haul road will access the South Quarry at 5,950 feet amsl and traverse down the north slope to an elevation of 5,050 feet amsl at the southwest corner of the existing East Pit. The road's surface width will be 50 to 60 feet with a grade not to exceed 10% and it will have a surface of crushed limestone (see Figure 6 and

Figure 6 Haul Road Detail

Sheet 2). The preliminary road design has estimated the required cut of 450,000 cubic yards (CY) based on 1 horizontal:1 vertical (1H:1V) slopes required to develop the road. The cut will generally be trucked to the primary crusher and used for cement production with surface material salvaged and stockpiled in the East Pit for reclamation and revegetation. In addition, to aid in the cutting of the access road, a temporary construction road approximately 755 feet in length and 25 feet wide (0.7 acres) will be cut from the end of an existing access road from the West Pit area. Upon completion of the main access road, this temporary road will be reclaimed and revegetated. The estimated disturbance area of the proposed haul road is 22.2 acres of which 6.6 acres is on MCC fee land and 15.6 acres on FS land.

Pre-Construction and Pre-Mining Activities

The following activities will be conducted prior to actual haul road construction and rock extraction in the quarry in order to facilitate ongoing and future reclamation and revegetation:

- Construction and excavation limits will be surveyed and marked in the field;
- Specified plants that can withstand removal will be salvaged and stored in a nursery and will be replanted on reclaimed land as areas become available for revegetation;
- Seeds of specified plants will be collected and either used for revegetation or stored appropriately for maximum future viability; and
- Any available soils will be stockpiled in separate identified stockpiles near the edges of the excavations for use as a seed bank and seedbed during reclamation. Soil stockpiles will be clearly marked and seeded with an erosion control native seed mix or covered with larger material to limit wind and water erosion.

Quarry Operations

The Plan proposes excavations to be undertaken in four phases with the development of the main 128-acre quarry to a maximum depth of 5,365 feet amsl or 1,215 feet below the quarry rim on the southeast (refer to Figure 5 and Sheet 2). The South Quarry will be generally oval shaped, 1,800 feet northeast to southwest, and 3,600 feet northwest to southeast with an extension along the haul road of 1,450 feet to the northwest.

In order to extract the limestone rock that exists on the site, blasting activities will be required to develop a series of benches and to break the rock into smaller pieces so that it can be removed. Blasting operations involve drilling along the mining face, placing of charges, and detonating of the charges by a licensed blaster under permit through the Bureau of Alcohol, Tobacco, Firearms and Explosives (BATF&E) for handling explosives. All explosives and detonators shall be transported, handled, and stored in accordance with all federal, State, and local regulations and permitted under the San Bernardino County Sheriff's Department and San Bernardino County Fire Department pursuant to Uniform Fire Code. It is expected that an average of two blasts per week will be required for developing the South Quarry depending on production and geology of the particular area being mined. Blasting is discussed in more detail under Section 1.6 below.

Limestone will be excavated at the South Quarry by standard open pit practices. Once an area is stripped of vegetation and available soil salvaged, controlled blasting will loosen the rock at a vertical benching interval of 45 feet. A dozer will push material and two to three loaders load the shot or broken rock into off-highway haul trucks. These trucks will transport material down the new haul road to the existing primary crusher located at the north end of the existing East Pit near the cement plant. Limestone which does not meet cement quality specifications and other rock types encountered will be pushed or hauled directly to waste rock stockpiles located within the southeast portion of the quarry. No new waste stockpiles will be developed outside the perimeter of the South Quarry to limit additional land disturbance and to reduce potential visual and erosion impacts.

Based on the slope stability analysis conducted by Golder Associates ("Assessment of Pit Slope Stability and Hydrologic Conditions", Golder, 2010; see Appendix C), the excavations will be designed to develop a series of stable rock slopes up to 45 feet in height with horizontal benches 25 feet wide (see Figure 7). Each bench will be sloped inward toward the vertical wall at 1 percent to capture any precipitation or runoff. The overall slope angle will be 60º or a slope of 0.55H:1V. Golder determined that the planned slopes will meet the stability criteria of a factor of safety of at least 1.5 against sliding and a pseudostatic factor of safety of at least 1.1 when subjected to the design earthquake. A geotechnical program of on-going field mapping, drilling and geophysical surveys, and laboratory testing shall be established and implemented as the quarry is excavated. This type of site investigation during the mining operation will provide information for detailed slope stability assessment on a continual basis and stabilization of slopes in areas where poor rock and/or adverse geologic structures are present. An annual report discussing the geotechnical program and its mapping will be prepared for the SBNF and County.

To reduce the possibility of boulder roll down or material erosion off-site on the down slopes to the north and east, specific excavation methods will be implemented. These include limiting the drilling and blasting when the outer quarry rim benches are being cut; blasting designed to undercut the outside wall; and excavating material by pulling into the quarry. Mining during Phases 2, 3, and 4 will expose the hillside on the north side. To reduce visual impacts from active excavations, a 20 to 25-foot high natural perimeter berm (half a vertical bench height) will be left in-place on the outside ridge until the interior area of the next lower excavation level is completed. This perimeter berm will limit views of active excavations except for a short period when the berm is lowered.

The quarry will normally operate approximately 250 days per year round, five days per week, 10 hours per day. Factors such as market conditions and maintenance requirements vary this schedule, occasionally necessitating a second shift or weekend work. In addition, due to the higher altitude of the site, the quarry operations may be suspended for one or two months during the winter due to snow. Approximately 11 employees will work on the South Quarry with 3 new employees required.

Based on 1.3 MTPY and 250 days/year, the average daily ore production would be 5,200 tons which will require approximately 50 to 55 truck trips to the crusher per day. An average of 600 tons of waste rock will be extracted per day which will require 6 to 7 truck trips per day. Note

the amount of ore and waste rock will be highly variable. When mining an area with high volumes of waste rock, then a like number of trucks moving ore to the crusher will be reduced.

Quarry Equipment

The following typical equipment in Table 1 will be utilized for the mining activities conducted within the quarry. The number, makes, and sizes of the mobile equipment will vary depending on required diesel emission standards, quarry needs, rock production, and normal replacement of old equipment.

Table 1
Typical Quarry Equipment
South Quarry

Equipment	Typical Number	Net Increase of Additional Equipment	Purpose
Dozer	1 – 2	0	Removal of topsoil and waste rock. Construction and maintenance of the haul road.
Off-Road Haul Trucks	2 - 9	3	Transportation of material to the primary crusher and onsite waste rock stockpiles. Note that 2 trucks will be dedicated to the South Quarry and up to 7 trucks will rotate with the West Pit operations as needed.
Drill Rig	1	0	Drill holes for placement of explosives.
Water Trucks	1 – 2	0	Water haul roads, active excavation areas, stockpiles, and general dust suppression at site.
Front-End Loaders	2 - 3	0	Loading of materials into haul trucks at active mining area.

Source: MCC, 2010
Note that the typical number of pieces of equipment does not represent a net increase in equipment for the overall Cushenbury Mine area as most operations at the South Quarry will utilize existing equipment. The net increase of additional equipment is three new haul trucks.

Quarry Phasing

The excavation plan for the South Quarry is divided into four phases based on operational, engineering, and environmental concerns (refer to Figure 5 and Sheet 2). Figure 8, Cross Section A in Figure 5, and Sheet 2, show the phasing in a cross section from the northwest to the southeast portions of the quarry. Table 2 lists the pertinent data per mining phase including the expected years of operation based on average production rates, size, ore reserves, and waste rock. The South Quarry is proposed to be excavated according to this phasing plan. However, mining operations will experience unscheduled interruptions and/or phasing changes due to

Figure 7 Quarry Slope Details

Figure 8 Cross Section A

Table 2
Planned Quarry Phasing and Production
South Quarry

PHASE	Area (acres)	Volume (millions of cubic yards)	Weight (millions of tons)	Ore Reserves (millions of tons)	Waste Rock (millions of tons)	Max. Depth (feet amsl)	Years of Operations
1A	11	2.3	5.1	4.5	0.5	5,860	3.5
1B	32	14.6	32.1	28.8	3.2	6,130	22.0
2	85	9.6	21.0	18.8	2.2	6,220	14.5
3	(75)[1]	26.4	58.0	52.0	6.0	5,905	40
4	(65)[1]	26.4	58.0	52.0	6.0	5,365	40
Totals	**128**	**79.3**	**174.0**	**156.0**	**18.0**	**5,365**	**120**

Notes: Source: MCC, Lilburn Corp. 2010
All volumes are estimated.
Area rounded to nearest acre. Totals may be slightly different due to rounding.
Millions of cubic yards and tons rounded to nearest tenth.
In-situ or in-place limestone rock weight to volume ratio estimated at 2.2 tons per 1 cubic yard.
Years of operations based on average production of 1.3 million tons per year for 120 years.
Waste rock estimated at 0.15 million tons per year or approximately 10% which will vary depending on area being excavated.
1 – Phases 3 and 4 areas excavated with depth within Phase 2 area previously disturbed.

various market/economic demands and variation in slopes and material quality beyond MCC's control since the natural deposit is not of uniform quality. It may be necessary, therefore, to excavate selectively from different locations within the quarry to achieve a suitable blend of raw materials. The SBNF and the County will be updated in the annual monitoring report on the status of operational phases.

The following is a summary of the planned mining operations by phase.

Phase 1A

Phase 1A will be initiated after construction of the haul road and compliance with pre-construction conditions and has ore reserves of approximately 3.5 years. The expected length of Phase 1A is based on an estimated reserve of approximately 4.5 million tons and an ore production rate of 1.3 MTPY. Approximately 500,000 tons of waste rock or less will be produced which will be used for the southern berm and stored in temporary stockpiles in Phase 1A and deposited into permanent stockpiles in Phase 1B as it is developed. Note that Phase 1A will not be completely excavated prior to initiating mining in Phase 1B.

Based on the bore hole data, minimal waste rock is expected in this area. This phase is essentially an extension of the haul road of which approximately 1,600 feet will be excavated up to 300 feet deep into the quarry area as the quarry is excavated (refer to Figure 5 and Sheet 2). The phase and extended haul road were designed in this way in order to depress this portion of

Figure 9 Cross Section B

the haul road below the remaining cut on its north facing slope and to reduce the road's grade as it is extended across the quarry to Phases 1B and 2. This will reduce the exposure of this area from views from Lucerne Valley. Please see Cross Section B in Figure 9, which shows the proposed excavations.

Phase 1B

Phase 1B will excavate the southeast 31 acres of the quarry (refer to Figure 5 and Sheet 2). Mining will create a horseshoe-shaped quarry that will extend from the southern quarry rim of 6,580 feet amsl to a floor elevation of approximately 6,130 feet amsl, a maximum depth of approximately 450 feet. Slopes will be constructed at a 0.55H:1V with 45-foot vertical cuts and 25-foot horizontal benches in the hard rock formations. Reserves are estimated at about 29 million tons of ore. At an ore production rate 1.3 MTPY, 1B will have a life of approximately 22 years. Mining and the transport of ore to the primary crusher will be the same as described for Phase 1A. Approximately 3.2 MT of waste rock may be produced in Phase 1B which will be used for the southern berm and deposited in permanent stockpiles in this phase.

Phase 1B was designed to (1) avoid the access road to the old Mohawk Mine as well as the old Mohawk Mine itself; (2) avoid the stream channel along its southwest rim which drains into Marble Canyon; (3) create at least one bench along the northeast quarry to reduce open views of the quarry from the northeast and east (as compared to daylighting the cut into the downslope); (4) recover the high grade limestone to a depth of 6,130 feet amsl per drilling log data; and (5) provide an internal area within the quarry to permanently stockpile the waste rock from Phases 1A, 1B, and 2. The development of internal waste rock stockpiles will reduce the area of disturbance outside the quarry rim, eliminate potential visual impacts of the waste rock piles, and reduce internal slopes in Phase 1B to 1.5H:1V to aid in revegetation. Please see Cross Section E in Figure 10, which shows the proposed excavations and the waste rock backfill.

This portion of the quarry could be accessible from the south by the public driving or hiking in the Burnt Flat area along the old Mohawk Mine Road. The road from the south is blocked by a permanently locked SBNF gate approximately 0.25 miles south of the site and the road is not maintained north of the gate. To further reduce the accessibility of the quarry, MCC is planning on constructing a landscape and safety berm along the southern rim for a distance of approximately 2,330 feet. This berm will tie into steeper slopes on the east and the southwest to restrict access. The berm will be composed of waste rock and salvaged soil approximately 6 feet in height with 1.5H:1V slopes (see Figure 11) and will cover approximately 2.7 acres with the adjacent set back and access road. The berm will include placement of a mixture of large rocks to discourage riding over it, warning signs, and revegetated with native vegetation. Note that an emergency fire access road will be maintained to the south for mine employees on existing roads.

Along other portions of the quarry rim, a 25-foot wide set back with safety berms 4 feet in height with 1H:1V slopes and oversized boulders will be constructed along any quarry rim areas susceptible to public trespass. Warning signs will be installed along all sides of the rim at least 18" by 18" with contrasting background lettering every 250 feet and shall read in English and Spanish "Danger" "Open Pit Mine" or "Steep Slope."

Figure 10 Phase 1B, Cross Section E

Figure 11 Landscape Berm Cross Section

Phase 2

Phase 2 will excavate the central 85 acres of the quarry (refer to Figures 5 and 8 and Sheet 2). Mining during this phase will essentially level the quarry and create an oval shaped quarry. The quarry depth will extend from Phase 1B with an average base elevation of 6,220 feet amsl. Slopes will be constructed at a 0.55H:1V with 45-foot vertical cuts and 25-foot horizontal benches in the hard rock formations. Reserves are estimated at 19 million tons of ore. At an ore production rate 1.3 MTPY, Phase 1B will have a life of approximately 14.5 years for a cumulative total of 40 years from the commencement of mining. Mining and the transport of ore to the primary crusher will be the same as described for Phase 1A. Approximately 2 MT of waste rock may be produced in Phase 2 which will be deposited into permanent stockpiles to fill a portion of the southern slopes in Phase 1B.

The development of internal waste rock stockpiles will reduce the area of disturbance outside the quarry rim, eliminate potential visual impacts of the waste rock piles that are highly visible, and reduce internal slopes to aid in revegetation. Please see Cross Section C in Figure 12, which shows the proposed excavations.

Phase 3

Phase 3 will be 40-year excavation phase on approximately 75 acres within the central part of the quarry within the footprint of Phase 2. Mining will excavate to floor elevation of approximately 5,905 feet amsl, a depth of approximately 315 feet amsl below the Phase 2 floor elevation of 6,130 feet amsl (refer to Figures, 5, 8 and 12). Slopes will be constructed at a 0.55H:1V with 45-foot vertical cuts and 25-foot horizontal benches in the hard rock formations. Reserves are estimated at over 52 million tons of ore. Mining and the transport of ore to the primary crusher will be the same as described above. Approximately 6 MT of waste rock will be produced in Phase 3 which will be deposited into the permanent stockpiles in Phase 1B.

Phase 3 was designed to maximize the recovery of the limestone resource with depth while staying within the planned 128–acre perimeter and create benches on the northeast side of the quarry to reduce open views of the quarry (as compared to daylighting the cut into the downslope).

Phase 4

Phase 4 will be the final excavation phase on approximately 65 acres within the central part of the proposed South Quarry configuration for the 120-year lifespan. Mining will excavate to floor elevation of approximately 5,365 feet amsl, a maximum depth of approximately 550 feet amsl below the Phase 3 floor elevation of 5,905 feet amsl (refer to Figures, 5, 7, 8, and 12). Slopes will be constructed at a 0.55H:1V with 45-foot vertical cuts and 25-foot horizontal benches in the hard rock formations. Reserves are estimated at 52 million tons of ore. At an ore production rate of 1.3 MTPY, Phase 4 will have a life span of approximately 40 years. Mining and the transport

Figure 12 Cross Section C

of ore to the primary crusher will be the same as described above. Approximately 6 MT of waste rock will be produced in Phase 4 which will be deposited into the permanent stockpiles on the southeast side of Phase 4.

1.2 WASTE ROCK

The production of limestone generates approximately 10 percent waste rock or approximately 150,000 tons per year of rock not suitable for cement processing depending on the quality of the limestone which varies throughout the quarry. Minimal amounts of overburden are expected as the limestone is generally exposed across the quarry site. Any topsoil onsite will be in the form of smaller eroded limestone gravel that may contain organic material and seeds. This surface material will be salvaged and stored in separately marked stockpiles for future reclamation efforts along and above the top benches and used for the construction of the landscape berm along the southern rim. Instead of removing the waste rock and depositing it in a separate waste stockpile(s) outside the rim of the quarry, this plan proposes to stockpile the waste rock within Phases 1B and 4 as mining progresses with depth. The development of internal waste rock stockpiles will reduce the area of disturbance outside the quarry rim, eliminate potential visual impacts of the waste rock piles, and reduce internal slopes to aid in revegetation. Based on 250 days of operations per year, an average of 600 tons of waste rock will be extracted per day which will require 6 to 7 truck trips per day depending on the volume of the haul truck. Note the amount of waste rock will be highly variable. When mining an area with high volumes of waste rock, then a like number of trucks moving ore to the crusher will be reduced.

1.3 ORE PROCESSING

Mineral processing will be conducted off the South Quarry site at the adjacent existing Cushenbury Cement Plant north of the existing East Pit. Limestone is crushed in three stages to minus 3/8 inch diameter and mixed with other materials to produce the raw mix which is heated to 2,700 degrees Fahrenheit in a rotary kiln then cooled and stored for shipping. Cement is shipped to various markets by bulk truck, train and in sacks. There will be no change in plant operations due to the proposed South Quarry.

The Cushenbury Cement Plant and its ancillary facilities comply with all applicable Federal, State, and Mojave Desert Air Quality Management District (MDAQMD) rules and regulations.

1.4 PRODUCTION WATER

Water will be used for road and mine dust control and will be obtained from existing water wells on MCC owned land (not SBNF land). This water will be hauled in a water truck (Cat 773 or Euclid R-50 typical with 13,000 gallon capacity) and sprayed on the haul roads and active mining area to minimize fugitive dust. The water truck will work continuously during active quarry operations as needed to control visible dust. Typically, the water truck will make up to eight trips/day and the estimated usage will be approximately 104,000 gallons/day. This water will evaporate and, therefore, the Proposed Project will not produce any wastewater or run-off. Note that MCC may also utilize approved chemical dust suppressants to control road dust which

would reduce water spraying frequency depending and the total amount used, depending on the outcome of on-site testing of this method.

A Preliminary Water Supply Assessment (WSA) was prepared (see Appendix N) in conjunction with the preparation of a California Environmental Quality Act (CEQA) Initial Study the Proposed Project and it becomes information used in the approval process. A WSA is required because the proposed project is a "processing facility" occupying more than 40 acres of land (Water Code Section 10912; SB 610). The Project Site is not within the service area of a public water supplier, but is within the boundaries of the Mojave Water Agency (MWA). MWA is a State Water Project contractor, a regional groundwater management agency, and serves as Watermaster for the adjudicated Mojave Basin. MCC owns four on-site and six off-site water wells, five of which are presently used to provide water for dust control at the mine operations. This water source will be used to meet water demands of the proposed South Quarry operations.

1.5 EROSION AND SEDIMENTATION CONTROL

Control of surface drainage, erosion, and sedimentation of the proposed haul road and quarry operations will involve the following primary components currently being implemented for existing operations:

- Limiting surface disturbance to the minimum area required for active operations.
- Diverting runoff, where operationally feasible, such that runoff from undisturbed areas does not enter the area of active operations.
- Using ditches, sediment basins, and localized control and maintenance measures to intercept and control runoff along the haul road.
- Stabilizing disturbance areas through regrading, revegetation, and other restoration practices.

Within the quarry, run-off from on-site precipitation will be directed and stored in typical retention basins. All operations on-site will comply with a National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges associated with industrial activities and employ storm water BMPs. NPDES goals are to eliminate unauthorized non-storm water discharges and to monitor storm water discharges requirements.

The planned control practices are described in the following:

Limiting Surface Disturbance

MCC will limit surface disturbance to those areas required for the proposed haul road and quarrying operations. Surface disturbance areas which will be subject to potential erosion and sediment loss will be limited through long-range planning, effective-design practices, phased

development of quarry expansion areas, sequencing of soil removal, and reclamation of disturbed areas.

Diverting Undisturbed Area Runoff

Drainage structures will be located and constructed to control flow velocities, provide for stability during their planned operating life, and minimize additional contributions of sediment to runoff flows. Based on Project area topography and the proposed development plans, it is anticipated that the need for diversions will be limited, with most runoff either flowing under the haul road in culverts or collecting temporarily in active quarry areas.

Disturbed Area Drainage Control

The site is very rocky and water erosion is expected to be minimal. The site will be visually inspected after major precipitation events to determine if any substantial erosion is evident such as sheet, rill or gully erosion or any surficial instability. Appropriate erosion control measures will be implemented where erosion is observed. Runoff resulting from direct precipitation on active and unreclaimed disturbed areas and uncontrolled runoff from up gradient undisturbed areas has the potential to cause erosion and resulting sediment loss, transport, and deposition, in both the disturbed and down gradient areas. In active quarry areas, drainage control generally will not be a significant concern since essentially all disturbed area drainage will be retained within the basin created by the quarry excavation.

For the haul road and waste rock stockpile areas, erosion and sediment loss and transport will be controlled through the use of localized drainage and sediment control measures. These measures will include construction of temporary diversion and collection ditches, berms, check dams or catchment basins; placement of erosion control materials, sediment fences, or straw bales; and other appropriate measures individually or in combination. Note that excavated benches will be designed to slope slightly back towards the vertical wall or cut to limit water flowing down the slopes.

The objective of all drainage control measures will be to limit flow volumes and velocities to minimize or prevent erosion and to promote settling of suspended solids before the runoff leaves the disturbed area. It is anticipated that drainage control measures will be implemented as needed based on regular inspection of operating areas. If initial evidence of any significant erosion or siltation is observed down gradient of any disturbed area, appropriate control measures will be identified and implemented on a timely basis.

Stabilization of Disturbed Areas

Disturbed areas will be stabilized to minimize both short- and long-term erosion and sediment loss. In the case of mine roads, short-term stabilization measures include regular road maintenance, establishment of temporary vegetation where appropriate, and stabilization of cut slopes and fills. Growth media stockpiles will be stabilized through establishment of a temporary vegetative cover if they are designed for storage periods exceeding 1 year.

Long-term stabilization, or reclamation, will generally involve grading or reshaping disturbed areas, establishing effective drainage, placement of plant growth media, and revegetation. Surface stabilization of quarry areas will consist of removal of loose rocks from highwall areas, and growth media replacement and revegetation of quarry bench surfaces. Following reclamation, the majority of surface runoff from quarry areas will be retained in the quarry limits where it will either infiltrate or evaporate.

1.6 BLASTING

Blasting operations are and will continue to be conducted by licensed individuals in such a manner as to meet or exceed Cal-OSHA requirements. MCC has four licensed individuals on staff. Blasting will typically be conducted twice each week at the South Quarry between the hours of 10:00 a.m. and 6:00 p.m. Monday through Saturday. Note that during the initial construction of the haul road, more numerous (up to once per day) but smaller blasts will occur. Blasting materials are secured in an appropriate magazine located at the adjacent cement plant facilities.

Blasting operations will involve drilling along the mining face, placement of charges, and detonation of the charges by a blaster licensed through the Bureau of Alcohol, Tobacco, Firearms and Explosives (BATF&E) for handling explosives. All explosives and detonators shall be transported, handled, and stored in accordance with all federal, State, and local regulations and permitted under the San Bernardino County Sheriff's Department and San Bernardino County Fire Department pursuant to Uniform Fire Code adopted by the Department. In compliance with County regulations, blasting shall only be conducted by a licensed blaster upon issuance of a blasting permit and a site-specific blasting permit.

2.0 RECLAMATION PLAN

2.1 LAND USE

The site is located on the north slope of the San Bernardino Mountains south of Lucerne Valley in southwestern San Bernardino County. The South Quarry and haul road will be located almost entirely (147 acres) on 440 acres of unpatented claims owned by MCC on public federal land under the jurisdiction of the SBNF with approximately 6.6 acres of the haul road located on MCC fee land (refer to Figure 3). The Proposed South Quarry site is bounded on the west, south, and east by vacant, natural open space forest lands and to the north by approximately 800 feet of SBNF land and then by the existing East Pit, West Pit (under development), and the Cushenbury Cement Plant.

The "Land Management Plan, Part 2 San Bernardino National Forest Strategy" (USDA September 2005) defines the Proposed Project area as the "Desert Rim." The Desert Rim is described as "a high desert, remote, rugged landscape formed by complex geological faulting. Today, the majority of the land is valued in the production of large quantities of high quality, limestone mineral deposits used in the production of pharmaceuticals and cement. These carbonate deposits are also valuable habitat supporting four species of threatened and endangered plants found nowhere else in the world." An intensive collaborative effort led to the development of the Carbonate Habitat Management Strategy (CHMS) in 2003. The strategy is designed to provide long-term protection for the carbonate endemic plants and also provide for continued mining. Carbonate habitats are protected from mining impacts in perpetuity within the carbonate habitat reserves dedicated and managed as described in the CHMS.

The Desert Rim Place is maintained as a modified to natural appearing landscape that functions as a sanctuary for several federally listed native plants and a highly valued area for limestone production. SBNF management is expected to center on implementation of the CHMS and to continue mining while preserving and managing habitat for federally listed plants that occur in this area.

The County land use designation for the site is RC – Resource Conservation.

2.2 VISIBILITY

The Proposed Project will be located at a higher elevation than the existing East Pit and the West Pit now under development. Through Phase 3 of the quarry development (approximately 80 years), only the upper portion of the site will be visible, and it will be visible only from portions of Lucerne Valley directly north and northwest of the site. During the last 40 years, Phase IV development would excavate the north side of the quarry exposing more of the quarry to the Valley. By this time some of the upper slopes will have undergone reclamation in the form of bench contouring, use of darker rock to reduce contrast, and revegetation of the benches with native plants including trees. Therefore, while more of the disturbed area will be visible, the

impacts to the viewshed of the upper slopes will have been reduced through reclamation and revegetation.

Figure 13 shows the location of two viewpoints, No. 1 from the north in Lucerne Valley near the Lucerne Valley High School approximately 9 miles northwest of the site, and No. 4 from SBNF lands from the south along SBNF Road 3N02, approximately one mile south of the site from an elevated road segment looking "down" on the site. Figure 14A shows a photograph of the existing conditions and a visual simulation of the site during Phase 1 mining (10 years). Figure 14B shows simulations for 25 and 40 years with concurrent revegetation. Figure 14C shows the site at the end of Phase 3 mining (80 years) and at the end of Phase 4 mining (120 years) with reclamation. The quarry will be seen as a lighter area on the east side of the mountain slopes.

Figure 15 shows existing and reclaimed site after year 125 looking from the south from SBNF lands. Views of the site from SBNF lands are limited due to terrain and lack of access and recreational facilities in this area. The SBNF Road 3N02 is located to the south of the site but ends at a locked SBNF gate in the Burnt Flat area approximately 0.5 miles south of the site, where the public access ends. The quarry will not be seen from this viewpoint due to the ridge in the foreground. The back ridge seen in the existing photograph will be removed during Phase 2 within years 20 to 40. Mining on this ridge may be visible for several years but thereafter, the quarry and mining activities will not be seen from this viewpoint.

The quarry and haul road will be designed to reduce exposure: the quarry road constructed on mostly cut with minimal fill slopes; waste rock will be deposited within the quarry to reduce the areas of disturbance; a 20 to 25-foot high natural perimeter berm (half a vertical bench height) will be left in-place on the outside ridge until the interior area of the next lower excavation level is completed; a landscape berm will be constructed along the south rim; and reclamation and revegetation will be implemented concurrent with mining to the extent feasible.

The development of internal waste rock stockpiles will reduce the area of disturbance outside the quarry rim, eliminating potential visual impacts of the waste rock piles that otherwise might be highly visible, and reduce internal slopes to aid in revegetation.

Potential impacts to scenic values will be fully assessed with additional viewpoints in the environmental document and a Scenic Report is included in Appendix J.

2.3 VEGETATION

Aspen Environmental Group prepared a Biological Resources Assessment in August 2010 included as Appendix D. Biological assessments were also conducted by the U.S. Forest Service and will be submitted separately. The biology reports provide a detailed discussion on on-site biological resources, which are summarized below. The environmental document will provide this biological data and assess biological resources, potential impacts, application of the CHMS, and mitigation.

FIGURE 13 VIEWPOINT LOCATIONS

FIGURE 14A VIEWPOINT 1 FROM LUCERNE VALLEY LOOKING SOUTHEAST

FIGURE 14B VIEWPOINT 1 FROM LUCERNE VALLEY LOOKING SOUTHEAST

FIGURE 14C VIEWPOINT 1 FROM LUCERNE VALLEY LOOKING SOUTHEAST

FIGURE 15 VIEWPOINT FROM SBNF ROAD 3N02 LOOKING NORTH

Within the site's elevation and geographic area, the northern San Bernardino Mountains support a mosaic of shrub lands and woodlands, including: desert-transition chaparral, generally dominated by cup leaf ceanothus, California juniper, bitterbrush, flannel bush, canyon live oak (shrubby form) and bigberry Manzanita; montane desert scrublands dominated by Great Basin sagebrush or rabbitbrush; and woodlands dominated by singleleaf pinyon and shrubby canyon live oak, often with high cover of curlleaf mountain mahogany. These habitats in the general area support a diverse assemblage of vertebrate wildlife described under Section 2.4 below.

The project area supports woodlands dominated by singleleaf pinyon (*Pinus monophylla*). Other characteristic species throughout the woodland include Utah juniper (*Juniperus osteosperma*), curlleaf mountain mahogany (*Cercocarpus ledifolius*), antelope brush (*Purshia tridentata*), and shrubby canyon live oak (*Quercus chrysolepis*). This vegetation matches the *Pinus monophylla* Woodland Alliance described by Sawyer et al. (2009, It also matches Holland's (1986) description of Mojavean Pinyon Woodland and Laudenslayer and Boggs's (1988) pinyon-juniper vegetation. There are steep canyons on the project site, but no evidence of riparian vegetation (e.g., willows, mulefat, or other characteristic montane riparian species). No running water, pools, or moist soils were noted in these canyons during field surveys conducted by Aspen or by Glenn Lukos Associates.

Pinyon woodland on the site is generally in relatively open stands, characterized by scattered pinyon pines and Utah junipers growing with montane shrubs. This composition is characteristic of early successional pinyon woodlands (Wangler and Minnich 1995; Neel 2000) and also is typical of woodlands on carbonate soils, which tend to be less productive than other soil types. The woodland generally matches Neel's (2000) descriptions of vegetation in the region, based on her extensive sampling on limestone soils throughout the northern San Bernardino Mountains. Neel's previous work is directly applicable to the local vegetation, soils, and flora, and provides more precise and detailed vegetation descriptions than recommended in SMARA guidelines for project site data collection. In Neel's (2000) description, Singleleaf Pinyon Series is dominated in the overstory by singleleaf pinyon pine and several characteristic shrub species, including Great Basin sagebrush (*Artemisia tridentata*), green ephedra (*Ephedra viridis*), narrowleaf goldenbush (*Ericameria linearifolia*), and antelope brush. Average overstory (tree canopy) cover was about 25% and average shrub cover was about 49%. That description is comparable to the pinyon woodlands on the proposed South Quarry site.

There are five federally listed threatened or endangered plant species endemic to carbonate soils, including limestone, in the northern San Bernardino Mountains (USDI Fish and Wildlife Service 1994). The Proposed Project site is within designated critical habitat for these carbonate-endemic plants (USDI Fish and Wildlife Service 2002). A Memorandum of Understandings and agreement was signed in 2003 by the USDA Forest Service, SBNF, Bureau of Land Management (BLM), San Bernardino County, Omya, Specialty Minerals, MCC, California Native Plant Society, and the Cushenbury Mine Trust stipulating that the signatories will implement the CHMS for the dual purpose of conserving threatened and endangered carbonate plants and streamlining mining operations.

Two of these listed species, San Bernardino Mountains bladderpod (*Lesquerella kingii* subsp. *bernardina*), which occurs on limestone outcrops around Big Bear Lake to the south, and Cushenbury milk-vetch (*Astragalus albens*), do not occur in this area or were not found onsite. Three listed threatened or endangered species were found on the Proposed Project site:

- Cushenbury buckwheat (*Eriogonum ovalifolium* var. *nudum*)
- Cushenbury oxytheca (*Oxytheca parishii* var. *goodmaniana*)
- Parish's daisy (*Erigeron parishii*)

These listed carbonate-endemic plants are managed by the SBNF, San Bernardino County, and other public agencies under the CHMS (Olson 2003). "Take" of listed carbonate-endemic plants is permitted under the strategy, and mitigated by permanent mining claim or private property set-aside and through management of off-site plant occurrences as outlined in the CHMS. MCC intends to be consistent with the CHMS and has proposed to mitigate impacts to these listed species through permanent conservation easements or other surface use restriction burdening unpatented mining claims at a compensation ratio of 3:1 in terms of "Conservation Value." For a more detailed discussion of the conservation easement and the mitigation lands, refer to MCC's carbonate plant mitigation proposal included as Appendix O.

Other special status plants including Coville's dwarf abronia, Parish's onion, Shockley's rock cress, San Bernardino Mountains dudleya, Johnson's buckwheat, and Parry's sunflower also occur on the site (see Appendix D, Sub-Appendix 2). None are listed, proposed for listing, or candidates for listing under state or federal Endangered Species Acts. Many of them share similar habitat requirements with the listed carbonate-endemic species.

The San Bernardino County Native Plant Protection policy (1989) regulates removal of trees greater than 6 inches diameter at breast height (dbh), and all plants in the agave family including Joshua trees. Pinyon pines greater than 6 inches dbh occur throughout the site.

Impacts from the Proposed South Quarry and associated haul road will likely cause losses of listed threatened or endangered species and to other special status plants. These impacts will be quantified in terms of areal extent of occupied habitat or numbers of mapped occurrences of each special status species occurring on or near the Proposed Project site and haul road alignment, and mitigation recommended within the environmental document.

2.4 WILDLIFE

Aspen Environmental Group prepared a Biological Resources Assessment in August 2010 included as Appendix D. Within the site's elevation and geographic area, the northern San Bernardino Mountains support a mosaic of shrub lands and woodlands described above. These habitats support a diverse assemblage of vertebrate wildlife. Characteristic reptiles of the area include common lizard species such as western fence lizard, side-blotched lizard, and western whiptail. Several snake species, including southwestern pacific rattlesnake, California whipsnake, coachwhip, and gopher snake, also occur regularly in the area, though they are less-commonly observed due to their largely nocturnal behavior. Typical bird species of the area

include red-tailed hawk, mourning dove, and house finch. Mammals of the area included desert woodrat, antelope ground squirrel, mule deer, mountain lion, American badger, and Nelson's bighorn sheep. There are no seasonal or perennial water sources on the Proposed Project site which could serve as breeding habitat for frogs or toads.

No state or federally listed wildlife species were observed. There is a low probability that southwestern willow flycatcher, desert tortoise or southern rubber boa could occur. Ongoing field studies will evaluate habitat suitability for these species on the proposed quarry site and haul road impact areas. No other wildlife species listed, proposed for listing, or candidate for listing as threatened or endangered will be affected by the Proposed Project.

In general, expected Project impacts to special status wildlife species will be loss of habitat and indirect effects of noise, lighting, dust, and other project-related disturbances on adjacent habitat. The Proposed Project will eliminate foraging habitat for certain raptors; breeding habitat for some migratory upland bird species; and year-around habitat for small mammals and reptiles, possibly including San Diego horned lizard or San Bernardino golden-mantled ground-squirrel. Several other special status wildlife species are likely to occur on the site. Suitable habitat and perhaps individual animals of these species could be lost during future quarry or access road construction. These impacts will be quantified in terms of areal extent of occupied habitat or numbers of mapped occurrences of each special status species occurring on or near the Proposed Project site and haul road alignment, and mitigation recommended within the environmental document.

Nelson's bighorn sheep are known from the general area, in habitats similar to those on the Proposed Project site. Sightings occur regularly around limestone quarries to the north. Nelson's bighorn (*Ovis canadensis nelsoni*) is one of three bighorn subspecies occurring in California. The others are California bighorn (*O. c. californiana*) of the Sierra Nevada and Peninsular bighorn (*O. c. cremnobates*), of the Santa Rosa Mountains, scattered ranges in San Diego County, and northern Baja California. The California and Peninsular subspecies are both listed as threatened or endangered by both state and federal agencies, but Nelson's bighorn occurs in substantial numbers in several mountain ranges and is not listed, proposed for listing, or a candidate for listing as threatened or endangered. It is managed as a protected species by the California Department of Fish and Game (CDFG).

Mining impacts to Nelson's bighorn sheep are difficult to quantify. Mining eliminates vegetation cover and food plants from the quarry and overburden sites, and increases equipment noise and human activity. On the other hand, bighorn sheep are regularly seen in local limestone quarries and their sign (scat, trails, and beds) is common to the west, including some areas immediately adjacent to active quarries. The local herd seems to have become acclimated to mining activities and makes regular use of quarries, perhaps because quarries provide shaded cover with expansive views. Bighorn sheep rely on rugged topography and early detection to avoid predators. Since bighorn sheep require both feeding habitat and safe areas where they can avoid predators, limestone mining may exchange one habitat requirement for the other. Sufficient data are not available to determine whether either of these habitat elements limits bighorn sheep

numbers in the northern San Bernardino Mountains. Impacts to Nelson's bighorn sheep are discussed in Appendix F and will be evaluated within the environmental document.

State and federal law prohibit take of native birds under the federal Migratory Bird Treaty Act and California Fish and Game Code. Golden eagles are fully protected by California law and have special federal protection under the Bald and Golden Eagle Protection Act. To avoid incidental killing of birds protected under the Migratory Bird Treaty Act, two measures will be implemented: (1) Complete all vegetation removal or initial grading outside the breeding season (i.e., do not remove potential nesting habitat from February 1 through August 31), or (2) confirm prior to beginning vegetation removal but after survey flagging is in place showing the limits of grading, that no birds are nesting in areas to be disturbed.

2.5 RECLAMATION

The intent of the California Surface Mining and Reclamation Act (SMARA) is to "maintain an effective and comprehensive surface mining and reclamation policy with regulation of surface mining operations so as to assure that: (a) adverse environmental effects are prevented or minimized and that mined lands are reclaimed to a usable condition which is readily adaptable for alternative uses; (b) the production and conservation of minerals are encouraged, while giving consideration to values relating to recreation, watershed, wildlife, range and forage, and aesthetic enjoyment; and (c) residual hazards to the public health and safety are eliminated" (Section 2712).

Article 9, Section 3700 of SMARA states the following: "Reclamation of mined lands shall be implemented in conformance with standards in this Article (Reclamation Standards). The standards shall apply to each surface mining operation to the extent that:

(1) they are consistent with required mitigation identified in conformance with CEQA; and
(2) they are consistent with the planned or actual subsequent use or uses of the mining site."

MCC proposes to reclaim the quarry site to meet both Forest Service Minerals Regulations (36 CFR 228, Subpart A) under the jurisdiction of the SBNF and SMARA implemented by the County that will minimize impacts to the surrounding environment. The objectives of this Reclamation Plan are to:

- Eliminate or reduce environmental impacts from mining operations;
- Reclaim in a usable condition for post-mining end uses which will include open space/habitat;
- Reshape mining features and revegetate disturbed areas to minimize aesthetic, biological, and hydrological impacts; and
- Reclaim the site as necessary to eliminate hazards to public health and safety.

Reclamation procedures are incorporated with the mine plans and operations in order to optimize costs and maintain economic efficiency. It is the intention, with proper reclamation planning, to introduce early reclamation measures for the developing quarry and to minimize impacts during future mining.

Mining plans presented herein are for a 120-year period of operation at a rate of 1.3 MTPY of ore. Since market demand for the finished product determines the rate of extraction, it is difficult to accurately forecast future demand for the limestone and to make exact long-term predictions. The time span of the total life of the operation is only an estimate and is subject to future modification in response to actual market conditions.

Another factor that may affect the time frame and phasing is the quality of material encountered as mining progresses, since the natural deposit is not of uniform quality. It is necessary, therefore, to excavate selectively from different locations to achieve a suitable blend of raw materials. Until the ultimate exhaustion of the limestone deposit, reclamation will progress in the manner described below.

The Reclamation Plot Plan is included as Figure 16 and attached as Sheet 3 of 4. Due to planned extraction, the permanent perimeter quarry slopes will be reclaimed from the rim downward as completed per phase to meet designed slopes dependent on the findings of the ongoing slope stability assessments. Reclamation will consist of sloping excavated cuts and benches as necessary to meet the designed 0.55H:1V overall slope and to round the rims of the final benches. Each bench will be sloped inward toward the vertical wall to capture any precipitation or runoff. The individual benches will be approximately 45 feet vertical and 25 feet wide unless required to be flatter in specific areas, as determined by geological mapping during ongoing quarry operations or where the waste rock stockpiles will be located. General slope construction during excavation will depend upon the nature of the slope material and shall be in accordance with the geotechnical slope reports. Some of the upper slopes as shown on Sheet 3 that may be visible from Lucerne Valley or areas of the SBNF will be sculptured (roughened) to reduce straight lines and visual impacts. In addition, at approximately every 500 feet, a ramp will be constructed to connect the benches to allow for wildlife movement within the reclaimed quarry.

Surface material salvaged for revegetation will be limited due to the surficial rock conditions on-site. Available material containing the native seed bank will be placed on the benches and will be augmented with additional growth media and mulch in “islands” to provide future sources of seeds. The revegetation methods include seeding with native perennial species, plantings grown in a nursery whether started from seed, cuttings or whole plant salvage from seeds collected at or near the site, and planting plants salvaged from new mining areas.

A summary of the general planned reclamation is listed in Table 3.

Phase 1A Reclamation

The initial development of the site includes the construction of the temporary construction road, permanent haul road and the 11 acres in the northwest. The slopes along the haul road and the

Figure 16 RECLAMATION PLOT PLAN (SHEET 3 OF 4)

Table 3
Reclamation Phasing Data
South Quarry

PHASE	YEARS OF OPERATION (estimated*)	PLANNED RECLAMATION ACTIVITIES
1A	1 - 5	Sloping, erosion control, and revegetation of haul road cuts and fills and south and north slopes of Phase 1A excavations. Reclamation of the temporary access road of 0.7 acres.
1B	6 - 82	Sloping, erosion control, and revegetation of upper slopes and benches as completed in the southern area to about the 6,400-foot amsl bench. Construction and vegetation of the landscape berm. Stockpiling of waste rock to reduce slopes to be occurring throughout phase.
2	26 – 42	Erosion control and stockpiling of waste rock in Phase 1B area.
3	43 - 82	Sloping, erosion control, and revegetation of upper benches as completed on the southwest and northeast sides the site to about 5,950-foot amsl bench. Stockpiling of waste rock in Phase IB. Reclamation of completed sections of Phase IB waste rock stockpile.
4	83 - 120	Sloping, erosion control, and revegetation of upper benches as completed in the central portion of site. Stockpiling of waste rock in Phase 4 area. Reclamation of Phase IB waste rock stockpiles.
Final Reclamation	121 - 125	Removal of equipment, stockpiles, and internal roads not needed for site access, revegetation, and site monitoring. Sloping, erosion control, and revegetation of any unreclaimed benches and waste stockpiles in Phase IV and quarry floor.

Source: MCC, Lilburn Corp., 2010

* The estimated life of each quarry phase is dependent upon the slope stability and slopes, extraction rate and product demand. These estimates assume an extraction rate of 1.45 MTPY and a five year period to conduct final reclamation at the estimated completion of Phase 4.

north and south slopes of Phase 1A will require sloping, erosion control, and revegetation. The temporary access road for construction of the access road will be stripped of any road base material, ripped, covered with available growth media, and revegetated per the revegetation plan after approximately 2 years.

Phase 1B Reclamation

The upper slopes of the southeastern portion of the quarry will be reclaimed upon completion. Most of this phase will consist of depositing and contouring waste rock to fill portions of the benches and slopes on the southeast slopes to 1.5H:1V as shown on Figure 10. The landscaped berm will be completed early in this phase with waste rock and soil material and revegetated.

Phase 2 Reclamation

Most of Phase 2 will remove the upper hills within the central part of the quarry perimeter and will be mined to depth in Phases 3 and 4. As such, the outside quarry walls will mainly be developed in later phases and no specific reclamation besides the salvaging of the growth media and plants prior to disturbance will take place during this phase.

Phase 3 Reclamation

The upper benches of the northeast and southwest sides of the site are scheduled to be reclaimed as completed during Phase 3. As slopes are completed to greater depths, final sloping, erosion control, and revegetation on the benches will be implemented to about the 5,950-foot amsl bench. The waste rock stockpile in Phase 1B will be finished with 2H:1V vertical slopes, ripped as necessary, covered with available top soil and growth media in "islands" pattern, and revegetated.

Phase 4 Reclamation

Quarry activities will be completed during Phase 4 and the site will be excavated as shown on Sheet 3 to a floor elevation of approximately 5,365 feet amsl. Final sloping, erosion control, and revegetation will be completed on the quarry benches as completed in the central portion of site and on the Phase 1B waste rock stockpiles. The waste rock stockpile in Phase 4 will be finished with 2H:1V vertical slopes, ripped as necessary, covered with available top soil and growth media in "islands" pattern, and revegetated.

Final Reclamation

Final reclamation will take place within the 5 years after termination of mining. All remaining equipment, stockpiles, and internal roads not needed for site access, revegetation, and revegetation and general site monitoring will be removed. Final sloping, erosion control, and revegetation of any unreclaimed benches, waste rock stockpiles, and quarry floor will be conducted. Note that some haul roads may be left on-site but reduced in width for use in the revegetation and monitoring activities and for overall site maintenance of fencing, signs, and erosion control. Roads not needed for site and quarry access will be stripped of any road base material, ripped, covered with available growth media, and revegetated per the revegetation plan.

2.6 REVEGETATION

Aspen Environmental Group prepared a "Revegetation Plan" which is included as Appendix L and summarized below.

The mature woodlands onsite are dominated by slow-recruiting species (pinyon pines, canyon live oaks, and juniper), therefore this plan will establish suitable conditions with pioneering species so that the climax species can be become established overtime. This two-phased revegetation will be undertaken on selected "islands" with salvaged topsoil application, seeding with appropriate pioneer shrub species including rabbitbrush, Great Basin sagebrush, California fremontia, and cupleaf ceonothus, and monitoring and maintenance activities until the site is favorable for planting and seeding of "climax" trees and shrubs. Nursery-grown pinyon pine, canyon live oak, Utah juniper, and curl-leaf mountain mahogany will be planted at that time. It is expected that the islands will trap windblown seeds and attract wildlife to aid in seed dispersal. Those areas with steeper slopes on road cuts, will be hydroseeded with appropriate native seeds and mulch.

The revegetation plan will implement a series of activities to revegetate portions of the site including the quarry benches. Due to the very rocky existing conditions, only a limited amount of topsoil or growth media will be available for salvage and resoiling. In addition, the excavated slopes will be solid rock. Revegetation is planned to be undertaken on the 25-foot wide benches in "islands" with available soils, seeds, and salvaged and nursery-grown plants.

The revegetation plan's objectives are to establish islands of shrubs and grasses on approximately 30% of bench and other disturbed areas; plant and seed pinyon pine, canyon live oak, Utah juniper, and salvaged yuccas onto these islands after initial establishment; establish cover on steeper cut slopes through hydroseeding; conduct concurrent revegetation; and monitor and implement remediation activities to achieve success criteria over the life of the plan.

Physical reclamation procedures will include the following:

- Regrading as necessary to achieve planned slopes;
- Roughening or ripping the compacted surface to hold moisture;
- Adding any stockpiled surface material and soil containing banked seeds in "islands";
- Seeding with native seeds augmented with native commercially available seeds as necessary;
- Planting with salvaged plants directly and from plants grown in nursery from onsite seeds and cuttings;
- Staking or flagging reclaimed areas to eliminate additional disturbance;
- Irrigate as deemed appropriate to aid initial growth and survival;
- Monitoring for success and determining need for remediation; and
- Application of remedial activities including by not limited to additional seeding and planting, plant protection, irrigation, change of seed and plant mix, adding soil amendments or fertilizer as deemed necessary by the Project botanist.

Revegetation Goals

The primary goal for revegetation of the South Quarry is to revegetate all areas disturbed by mining with a self-sustaining vegetative cover of native species including listed "carbonate" plant species. Related objectives include:

1. Minimize visual impact of disturbances;
2. Initiate biological productivity so that natural processes can restore diversity and ecological function;
3. Minimize erosion
4. Enhance and restore suitable habitat for listed carbonate-endemic plants and for Nelson's bighorn sheep; and
5. Minimize occurrence of exotic plant species.

Mine employees will be provided with training on the goals and practices of concurrent reclamation on the site including: identification of revegetation areas, growth media piles, and

salvage plant nurseries; what plants and animals to watch for; and how the reclamation plan integrates into their job. The training will be given by a reclamation specialist in person or on video. The training will emphasize that land stewardship is an integral part of the mining process, rather than something to be done separately after mining.

Baseline Data

Within the site's elevation and geographic area, the northern San Bernardino Mountains support a mosaic of Pinyon – Juniper woodlands, including: desert-transition chaparral, generally dominated by cupleaf ceanothus, California juniper, bitterbrush, flannel bush, canyon live oak (shrubby form) and bigberry Manzanita; montane desert scrublands dominated by Great Basin sagebrush or rabbitbrush; and woodlands dominated by singleleaf pinyon and shrubby canyon live oak, often with high cover of curlleaf mountain mahogany. (Refer to Section 2.3 and Appendices D and E for detailed vegetation descriptions.)

The woodlands portion of the project site is described as pinyon woodland generally in relatively open stands, characterized by scattered pinyon pines and Utah junipers growing with montane shrubs. This composition is characteristic of early successional pinyon woodlands (Wangler and Minnich 1995; Neel 2000) and also is typical of woodlands on carbonate soils, which tend to be less productive than other soil types. The woodland generally matches Neel's (2000) descriptions of vegetation in the region, based on her extensive sampling on limestone soils throughout the northern San Bernardino Mountains. Neel's previous work is directly applicable to the local vegetation, soils, and flora, and provides even more detailed vegetation descriptions than recommended in SMARA guidelines for project site data collection. In Neel's (2000) description, Singleleaf Pinyon Series is dominated in the overstory by singleleaf pinyon pine and several characteristic shrub species, including Great Basin sagebrush (*Artemisia tridentata*), green ephedra (*Ephedra viridis*), narrowleaf goldenbush (*Ericameria linearifolia*), and antelope brush. Average overstory (tree canopy) cover was about 25% and average shrub cover was about 49%, which is comparable to the pinyon woodlands on the proposed South Quarry site (see Table 4 below).

These data are used to establish the cover and diversity of each species per unit area per SMARA guidelines and to determine success criteria for future revegetation. Estimates of plant cover based on these plots are percent, density is plants/acre, and species richness or diversity is number of different species per 0.1 acre plot.

Table 4
Vegetation Characteristics of Pinyon Woodlands
on Limestone Soils in the Northern San Bernardino Mountains

Vegetation Type	Tree Cover	Shrub Cover	Shrub & Tree Cover	Shrub & Tree Species Richness	Tree Density
Pinyon woodland (including mixed stands w/ Utah juniper or Canyon live oak and early-successional shrub-dominated stands)	25%	49%	74%	10 spp. / 0.1 acre plot	84 / acre

Source: (From M. C. Neel 2000) within "Biological Resources Assessment," Aspen Environmental Group, August 2010 included as Appendix D

Plant Salvage

Plant salvage preserves both spatial and temporal diversity. Spatially, salvage preserves rare or protected plants and preserves local genetic material and local genetic diversity. Temporally, whole plant salvage preserves mature plants that take many years of growing time to replace.

In some cases, salvaged material is the easiest way to put plants into revegetation areas. In other cases, salvage is difficult, but is available to preserve genetic material or start plants when seed is not available. For a given plant species, if seed is readily available, and can easily be grown, propagation from cuttings will not be necessary for that species. A listing of plant species to be salvaged is discussed below.

Whole Plant - In this method, the entire plant is excavated, including as much of the root system as possible and transplanted to a new site. For some shrubs and grasses, the tops are cut back (to minimize transpiration pressure) before excavating the root system. Whole plant salvage can be done by hand or by using a tree spade and can preserve up to 100 years of growth. Small to large plants can generally be hand salvaged economically with a good success rate. Tree spading has an even higher success rate, but is too costly to use on a large scale and is best used in special situations where particular large plants need to be saved or where large plants are needed to block access to a revegetation area, or to provide initial amelioration of conditions on bare ground.

Cuttings (Vegetative Reproduction) - In this method, a portion of the plant is separated from the entire plant. This allows the unsalvaged portion to survive while the cutting is planted elsewhere (usually a greenhouse or nursery to allow rooting). For species that can be salvaged by cuttings, salvage can be delayed until plant material is needed because material can be salvaged from: nursery stock, greenhouse stock, or areas that won't be disturbed by mining. This method is most

common for cacti, grasses, and some Yucca species, but techniques for growing various shrubs from cuttings have also been developed.

For grasses, whole plants can be salvaged and then can be cut into multiple clumps rather than the taking of "cuttings", as one would from shrubs.

Important Salvageable Plants

Salvageable plants include:

Carbonate Plants
Three listed carbonate plant species, Parish's daisy (*Erigeron parishii*), Cushenbury buckwheat (*Eriogonum ovalifolium*), and Cushenbury oxytheca (*Oxytheca parishii*) have been found on the mine site. These species will be a major focus of salvage efforts because of their sensitive status. Ongoing work by MCC on the salvage of these species will be studied and the best methods for salvaging and transplanting these species from sites ahead of disturbance into a nursery or greenhouse and for outplanting them back into revegetation areas will be developed.

Yucca Species
Yucca species to be salvaged to provide mature plants in revegetation areas include: Yucca shidigera (whole plant or cuttings); Yucca brevifolia (whole plant); and Yucca whipplei (whole plant).

Cacti
Although most Mojave Desert cacti routinely produce viable seed, growth from seed is very slow. Salvage of cacti allows placement of mature cacti into revegetation areas and preserves local genetic diversity. Cacti as found onsite may include the following: Opuntia basilaris (beavertail cactus) (whole plants or pads) and Echinocereus engelmannii and E. triglochidiatus (hedgehog and Mojave mound cactus) (whole or in pieces).

Seed Collection

Seed collection will be conducted continually at the mine utilizing a combination of employees, commercial nurseries, research nurseries and educational institutions. Seeds are collected and either stored for use in broadcast seeding or germinated and used to produce plants that are grown in nurseries for later use in out planting. Experimental test plots have been established on the cement kiln dust stockpile and several mine benches.

Seeding treatments are included to determine potential effectiveness of broadcast seeding in restoring the site. Seed for the experimental plots will be collected from local carbonate soils each year from as many plant species as possible.

Seed is cleaned and weighed to determine total number of seeds per pound. Greenhouse germination analysis is conducted to determine percent viability. Seed of known viability will be scattered onto test plots at known densities to allow calculation of successful germination.

Species, seeding densities, viability, will be recorded in permanent notes throughout the experiments.

Results of study plots will be evaluated by allowing growing seedlings to reach a stage where they can be identified to species. All identifiable plants will be recorded from each plot when it is identified. Total number of germinating plants will be tallied by species for each plot.

Germination rates of early and late spring seed bank samples will be used to determine which season will be best suited to revegetation planning. Higher total numbers are expected in the early spring samples, but later samples may contain fewer weed seeds, perhaps resulting in better results.

Germination rates of baseline topsoil samples will be compared each year to the baseline rate and to rates of new samples collected annually to determine rate of decline in stored topsoil seed viability. If these studies show that viability deteriorates severely over the period, then direct seeding shall be used with suitable treatment to break seed dormancy.

Topsoil (Growth Media) Salvage and Conservation

In order to minimize the storage period for salvaged topsoil, vegetation and topsoil shall be collected in increments, removed only from the area to be disturbed during the next two years. Salvageable Joshua trees and cacti will be collected for direct transfer to revegetation sites, temporary planting in a storage nursery, or bare root storage. To the extent feasible, woody material and other plant material shall be removed from the collection site before topsoil collection and mixed with subsoil. Storage time shall be minimized to avoid seed mortality.

The available surface material will be salvaged and graded into shallow stockpiles along the quarry perimeters for ongoing or future reclamation. The salvaged material will be stockpiled separately and clearly identified. This surface material will be used as growth media and seed bank for the revegetation effort. Concurrent revegetation will be undertaken as soon as bench areas are mined to the approved plan design in order to reduce the time the surface materials are stored. In addition, if the stockpiles are composed of fine materials susceptible to wind erosion, there will be water sprayed to form a surface crust or covered with larger gravel materials.

Because there is a lack of surface material, the soil available for revegetation is insufficient to cover the entire disturbed area of the mine. Therefore, soil will be used to create “islands” within the mined area that will be the focus of the initial revegetation efforts.

Site Preparation

The site will be graded to minimize erosion and maximize rainwater holding capacity. Compacted areas will be ripped to depth of 1 foot if feasible due to the rock material to relieve compaction and to create an uneven surface. This will aid in collecting wind borne seeds and moisture and create more favorable microhabitats.

After final grading and contouring, growth media salvaged from newly mined areas will be placed loosely on areas to be revegetated to create an uneven surface to a depth of 6 to 12 inches. Soil will be slightly compacted to reduce erosion. It will not be compacted to engineering standards.

Rocks and salvaged woody plants will be placed upon areas to be seeded to create "islands" where seeds can fall out of the wind and where moisture can be retained though the creation of shaded microhabitats. These "islands" will serve as nursery areas within the larger area to be revegetated. The final surface will not be uniform; rocks, limbs, furrows and crevices will provide topographic diversity, increasing the probability that seed will become located in suitable microhabitat for germination and long-term survival. If surface irregularities cannot be left because of the soil spreading technique or other limitation, then soil roughening or "imprinting" should be used to create irregularities.

Seeding

The main seed mix used for past seeding of quarry benches is included in Table 5 below. The seed mix will be adapted based on seeding and test plot experiments. Many plant species will not establish when seeded. These species will not be used in the final seed mix. Seed mix for a particular site will be determined by the site's physical characteristics. Seed will be placed by broadcast seeding or by drill seeding. Initially, seeded areas will be alternated with unseeded areas so that success of seed mix can be tested.

Table 5
Proposed Seed Mix for Initial Seeding
South Quarry

Common Name	Latin Name	Lb./acre
Desert needlegrass	*Stipa speciosa*	10
Indian ricegrass	*Oryzopsis hymenoides*	10
Parish's needlegrass	*Stipa coronate var. depauperata – var not known*	10
Bigberry manzanita	*Arctostaphylos glauca*	2
Great basin sagebrush	*Artemisia tridentata*	5
Cupleaf ceanothus	*Cea noth us greggii*	2
Curl-leaf mountain mahogany	*Cercocarpus ledifolius*	10
Common rabbitbrush	*Chrysothamnus nauseosus*	5
Green ephedra	*Ephedra viridis*	5
California fremontia	*Tremontodendron californicum*	5
California buckwheat	*Eriogonum fasciculatum var. polifolium*	5
Totals		**69**

Sources: Aspen Environmental and S & S Seeds, November 2010

Placement of Salvaged Plants

Salvaged plants will be placed in revegetation areas by hand or tree spade and identified for data keeping. Tags will be developed that will last for up to five years. Database data for each plant will include date planted, history of salvaged plant, and method of planting. Altitude and site physical characteristics will determine which species are suitable for the site. Plants spacing and arrangement will be determined by measurements taken in reference areas.

MCC contracts with commercial and research nurseries for plant propagation. In addition, an open structure providing partial shade shall be constructed on-site for plant storage and acclimation before outplanting. Data for all outplantings will be kept in a log book showing propagation conditions, species and height for each plant. Plants will be evaluated throughout the monitoring period.

Seeded areas and outplantings will be irrigated periodically during each of the first two growing seasons. Irrigation schedules will be determined by professional judgment, based on natural rainfall and soil conditions. The objective of irrigation is not to maximize growth rates, but instead to maximize establishment of plants to the point where artificial irrigation is no longer needed.

Placement of Container Grown Plants During Second Phase

Container grown plants including pinyon pine, canyon live oak, Utah juniper, and salvaged yuccas will be placed onto these islands after initial establishment suitable for introduction of the climax species by hand and identified for data keeping. Database data for each plant will include date planted, history of seed or propagule plant was started from, plant propagation history, and method of planting. Tubex, TreePees or hardware cloth herbivore protection will be placed around individual plants if necessary for protection from herbivores. AM fungal inoculum will be added to plants during propagation if necessary.

Herbivore Exclusion

Cattle, sheep, burros and rabbits all can do serious damage to revegetation areas. If cattle and burros are a problem on revegetation sites, the sites will be fenced. If rabbits are a problem, Tubex, TreePees and hardware cloth cages can be placed around individual plants to allow them to establish. Timing of planting can be manipulated to minimize rabbit damage also. In a dry summer after a wet spring, outplantings are very lush compared to surrounding foliage and will be preferentially eaten by herbivores.

Success Criteria

Success criteria are based on the overall quality of the revegetation results compared to the recorded baseline vegetation data from Neel's description of vegetation in the region based on her extensive sampling on limestone soils throughout the northern San Bernardino Mountains (refer to Table 4). From completion of the revegetation for a specific area, the surviving

perennial plant species shall be evaluated annually by the consulting botanist for relative growth as determined by diversity and density. Individual specimens or areas shall receive appropriate remedial attention as necessary. Remedial actions may include removing invasive weed species, reseeding, adding soil amendments, and protection from herbivory. The above procedure will be repeated annually for a total of five years.

Successful revegetation of the site will be achieved when there is a self sustaining native plant cover established. The plants must be reproducing themselves without intervention such as irrigation, fertilization, additional seeding or plantings. The re-established plant cover will return other biological processes to the site. Wildlife will be able to re-occupy the site when plants are established providing cover and food sources. Soil development processes can begin, however at this location, processes are limited by the arid climate and are not expected to progress noticeably at this site. These processes are complex and subject to a great deal of variation through time due especially to the variable rainfall at the site, consequently, they are difficult if not impossible to measure. A simplified approach can be established based upon direct measures of individual plants.

The three required measures are plant cover (vertical projection of the plant canopy over the ground surface), density (number of individual plants per unit area) and species richness (total number of plant species) as listed in Table 4. Measures of the reference areas resulted in following data: plants of species provided square meters (m^2) of cover over 2,200 m^2 of sample area. Therefore, cover is percent (m^2/m^2), density is plants/m^2 (plants/m^2) and species richness or diversity of species.

Success will be a measure of the native shrub and tree cover, species density, and species diversity based on achieving 50% of the baseline data areas. Successful revegetation will be achieved when the revegetated areas have achieved the following:

- Cover by native tree and shrub species – 37% (50% of existing cover of 74%);
- Diversity or richness of a minimum 5 native tree and plant species per 0.1 acre (50% of existing 10 species per 0.1 acre);
- Density of average of 42 plants/acre (50% of 84 plants/acre);
- Less than 15 percent cover of non-native plant species cover; and
- Recruitment of seedlings of native plant species must occur demonstrating a positive trend in cover and diversity.

It is expected that initially, species richness will be high and density and cover low relative to the reference areas. As time proceeds, cover and density are expected to increase and richness to level off. Because these goals are being established without an empirical basis they may require adjustment in the future. Three federally listed plant species are known to occur within the mine area and they are intended to be included in the revegetation activities.

Establishment of plantings and volunteers on revegetated sites shall be evaluated according to survival rates, total native plant cover, and species diversity on the monitoring transects.

Survival, shrub species diversity (a gauge of successful volunteer establishment) and total native plant cover will be used to determine whether further plantings are needed.

If survivorship plantings is low but total native plant cover and shrub diversity are high (due to volunteers and/or vigor of surviving plantings), then success criteria will be met. Conversely, if survival is high but vigor and volunteer establishment are low, then remedial planting may be needed.

If non-native plant species average 15 percent or greater cover on monitoring plots at a given monitoring period, then that year's planting area will be weeded. Success criteria for seedlings and cuttings will be based on survival, performance, and volunteer establishment. Success criteria for soil loss will be subjectively developed by the geologist or hydrologist overseeing its monitoring.

Supplemental planting will be needed if success criteria are not met. Replacement grasses and shrubs will be planted to raise overall survival and cover to meet success criteria. Replacement plantings may use the same proportions used initially, or these may be modified according to the success of particular species.

Weed Control

The purpose of the weed control plan is to reduce or eliminate the occurrence of non-native plant species that may invade the site where mining activities have removed the native plant cover and where active and natural revegetation is taking place. Non-native invasive species (weeds) can compete with native plant species for available moisture and nutrients and consequently interfere with revegetation of the site.

Weed or non-native species of concern at the site may include some or all of the following. Many of these species are common on-site now and will be difficult to control. Exotic species known to occur in the vicinity of the site include:

Bromus rubens
Bromus diandrus
Bromus tectorum
Brassica tournetfourteii
Schismus barbatus
Poa pretense
Triticum aesitivum
Hirschfeldia incana
Salsola tragus
Descaurania pinnata
Sisymbrium altissimum
Sisymbrium erivio
Erodium circutarium
Marrubium vulgare
Galium angustifolium
Ulmus pumila

The occurrence of weeds on-site shall be monitored by visual inspection. The goal is to prevent weeds from becoming established and depositing seeds in areas to be revegetated at a later date. No areas will be allowed to have more than 20 percent of the ground cover provided by non-native plant species. If inspections reveal that weeds are becoming or have established on-site, then removal will be initiated. Inspections shall be made in conjunction with revegetation monitoring.

Weed removal will be accomplished through manual, mechanical or chemical methods depending on the specific circumstances. For example, solitary or limited numbers of tree and tree-like species will be manually removed (chopped) and the stumps sprayed with an approved weed killer such as Round-Up. Smaller plants (wild oats and bromes) that cover more area may be sprayed, scraped with a tractor, or chopped by hand, depending upon the size of the area of infestation and the number of desired native plants in proximity or mixed in with the weeds.

Reports of inspections and weed control implementation shall be part of the annual revegetation monitoring and kept on file by the operator.

Monitoring

The Biological Monitoring Plan will be an ongoing effort to assess the results of revegetation on the disturbed areas of the site. The monitoring plan will be followed annually to monitor and assess completed revegetated areas and areas where revegetation is being planned or just beginning. A Biological Monitoring Report submitted by MCC to the SBNF and the County will be part of the overall compliance with conditions. Revegetated areas will be assessed utilizing success criteria with successful methods being implemented for future revegetation.

Revegetation efforts will be monitored annually for five years after seeding and planting or until success criteria are met and vegetation is self-sustaining. Data on plant species diversity, cover, survival and vigor will be collected on revegetated sites and compared to baseline data from undisturbed sites to evaluate Project success. Revegetation observations will be summarized annually as part of the overall-monitoring program. This schedule may be revised depending on the results of the revegetation effort and the meeting of the success criteria.

2.7 CLEANUP

All clean-up operations will be conducted within one year of the termination of mining. Scrap material, refuse, equipment, and surplus materials will be removed, recycled, and/or disposed of at an appropriate landfill site. Excess material piles and disturbed areas will be regraded for positive drainage, scarified, and revegetated.

2.8 POST RECLAMATION AND FUTURE MINING

The planned land use subsequent to mining is open space and wildlife habitat. The quarry excavation and reclamation will result in a series of revegetated benches 25 feet wide and 45 feet high. The landscape berm on the south will remain as a safety and visual mitigation measure. Southern portions of the quarry will be partially backfilled with 1.5H:1V slopes and will aid in the reclamation and revegetation of this portion of the quarry slopes.

With additional exploratory drilling and expansion of the South Quarry area, future mining with depth and outside the planned configuration may be feasible. The quarry is surrounded by SBNF lands on the west, south, and east and by the existing East Pit and Cushenbury Cement Plant on

the north. Currently, the County land use designation is Resource Conservation (RC), which permits intensive land uses such as mining pursuant to a County approved Reclamation Plan.

2.9 SLOPE AND SLOPE TREATMENT

Based on a slope stability analysis conducted by Golder (see Appendix C), the excavations will be designed to develop a series of stable rock slopes up to 45 feet in height with horizontal benches 25 feet wide (refer to Figure 7). Each bench will be sloped inward toward the vertical wall at 1 percent to capture any precipitation or runoff. The overall slope angle will be 60º or a slope of 0.55H:1V. Golder determined that the planned slopes will meet the stability criteria of a factor of safety of at least 1.5 against sliding and a pseudostatic factor of safety of at least 1.1 when subjected to the design earthquake. A geotechnical program of on-going field mapping, drilling and geophysical surveys, and laboratory testing shall be established and implemented as the quarry is excavated. This type of site investigation during the mining operation will provide information for detailed slope stability assessment on a continual basis and stabilization of slopes in areas where poor rock and/or adverse geologic structures are present. A final slope stability assessment report will be prepared for the SBNF and County will assess the final slopes as part of the site closure.

2.10 PONDS, WASTES

There are no ponds or tailings type waste associated with the proposed South Quarry. All usable limestone will be transported to the existing primary crusher and used in the cement manufacturing process. Waste rock (rock which does not meet cement quality specifications and other intrusive rock types) will be stockpiled within the South Quarry so as not to disturb additional land and to reduce visual impact.

The production of limestone generates approximately 10 percent waste rock, approximately 150,000 tons per year or 18 MT of waste rock over 120 years not suitable for cement processing. Minimal amounts of overburden are expected as the limestone is generally exposed across the quarry site. Instead of depositing the waste rock in a separate waste stockpile outside the rim of the quarry, this plan proposes to stockpile the waste rock within approximately 25 acres in Phases IB and 4. The waste stockpiles will be slopes at 1.5H:1V and will backfill the southern area and reduce the steep cut slopes. The development of internal waste rock stockpiles will reduce the area of disturbance outside the quarry rim, eliminate potential visual impacts of the waste rock piles that are highly visible, and reduce internal slopes to aid in revegetation.

2.11 SOILS

The site is generally exposed limestone and has minimal soils onsite. Golder found no significant soil profile except in sheltered north-facing slopes where vegetative cover increases. Any available soils found in minor drainages and loose gravel found onsite that may contain organic material and seeds will be salvaged and stored in clearly marked separate stockpiles along the rim or initial benches and will be used in the southern landscape berm.

2.12 DRAINAGE AND EROSION CONTROLS

Diverting Undisturbed Area Runoff

Drainage structures will be located and constructed to control flow velocities, provide for stability during their planned operating life, and minimize additional contributions of sediment to runoff flows. Based on Project area topography and the proposed development plans, it is anticipated that the need for diversions will be limited, with most runoff collecting in active quarry areas.

Disturbed Area Drainage Control

Runoff resulting from direct precipitation on active and unreclaimed disturbed areas and uncontrolled runoff from upgradient undisturbed areas has the potential to cause erosion and resulting sediment loss, transport, and deposition, in both the disturbed and downgradient areas. In active quarry areas, drainage control is generally not a significant concern since essentially all disturbed area drainage is retained within the basin created by the quarry excavation.

For quarry development areas, roads, stockpile areas, and other disturbed areas, erosion and sediment loss and transport will be controlled through the use of localized drainage and sediment control measures. These measures will include construction of temporary diversion and collection ditches, berms, check dams or catchment basins; placement of erosion control materials, sediment fences, or straw bales; and other appropriate measures individually or in combination.

The objective of all drainage control measures will be to limit flow volumes and velocities to minimize or prevent erosion and to promote settling of suspended solids before the runoff leaves the disturbed area. It is anticipated that drainage control measures will be implemented as needed based on regular inspection of operating areas. If initial evidence of any significant erosion or siltation is observed downgradient of any disturbed area, appropriate control measures will be identified and implemented on a timely basis.

Stabilization of Disturbed Areas

Disturbed areas will be stabilized to minimize both short- and long-term erosion and sediment loss. In the case of mine roads, short-term stabilization measures include proper road design and construction, regular road maintenance, and establishment of temporary vegetation where appropriate, and to stabilize cut slopes and fills. Growth media stockpiles will be stabilized through establishment of a temporary vegetative cover if they are designed for storage periods exceeding 1 year.

Long-term stabilization, or reclamation, will generally involve grading or reshaping disturbed areas, establishing effective drainage, placement of plant growth media, and revegetation. Due to both operational and economic limitations, surface stabilization of quarry areas will be limited to removal of loose rocks from highwall areas, and growth media replacement and revegetation of

quarry bench surfaces. Following reclamation, the majority of surface runoff from quarry areas will be retained in the quarry limits where it will either infiltrate or evaporate.

2.13 PUBLIC SAFETY

The site is located in an isolated area with limited access. The steep slopes and rugged terrain on the adjacent areas limit the potential for the public to trespass on the site. The site's main haul road is controlled and gated at the adjacent Cushenbury Cement Plant, and effectively eliminates public entry.

The southern portion of the quarry could be accessible from the south by the public driving or hiking in the Burnt Flat area along the old Mohawk Mine Road although this area is not open to the public due to sensitive habitat. To reduce the accessibility of the quarry, MCC will construct and maintain a landscape and safety berm along the southern rim for a distance of approximately 2,330 feet. This berm will tie into steeper slopes on the east and the southwest to restrict access. The berm will be composed of waste rock and salvaged soil approximately 6 feet in height with 2H:1V slopes (refer to Figure 11) and will cover approximately 2.7 acres. The berm will include large rocks to discourage riding over it, warning signs, and revegetated with native vegetation.

There is no other readily available access to the site; however, along other portions of the quarry rim a 25-foot wide set back with safety berms 4 feet in height with 1:1 slopes, and oversized boulders will be constructed along any quarry rim areas susceptible to public trespass. Warning signs will be installed along all sides of the rim at least 18" by 18" with contrasting background lettering every 250 feet and shall read in English and Spanish "Danger" "Open Pit Mine" or "Steep Slope."

2.14 MONITORING AND MAINTENANCE

The California Environmental Quality Act (CEQA, Section 21081.6) requires that an agency prepare an environmental impact report prior to approving a project that may have significant adverse environmental impacts. CEQA also requires adoption of a reporting and monitoring program for the conditions of approval of a project that are intended to mitigate or avoid adverse environmental affects. The program is intended to ensure compliance with mitigation measures throughout the life of the Proposed Project. The program will identify the conditions of approval that act as impact mitigation measures and for each measure, outline who is responsible for implementation and verification of the measure. The program will be flexible in order to accommodate changes that are necessary to mitigate monitoring is not necessary.

In addition, the SMARA requires annual reporting of Mining and Reclamation activities. The reports are filed with the State Division of Mining and Geology, the SBNF, and the County. Revegetated areas will be monitored over a five-year period or until success criteria achieved following initial planting. Data on plant species diversity, cover, survival and vigor will be collected on revegetated sites and compared to baseline data from undisturbed sites to evaluate project success.

Monitoring and maintenance of reclamation is an ongoing responsibility of MCC. The South Quarry will be inspected as needed, at least annually, by the County and by the SBNF. As reclamation efforts increase through establishment of out planting of native species, the frequency of monitoring by MCC will increase commensurate with the activities being conducted. The individual monitor(s) shall be qualified revegetation specialists approved by the SBNF and the County.

2.15 RECLAMATION ASSURANCE

MCC shall post or cause to be posted reclamation assurance in an amount sufficient to pay for the cost of reclamation as outlined in Section 2. As the Proposed Project is within FS lands, the SBNF and the County will annually review the reclamation financial assurance cost estimate updated annually as required by SMARA. San Bernardino County is the lead agency for SMARA, which also requires the reclamation assurance to be reviewed and approved by the California Office of Mine Reclamation (OMR).

STATEMENT OF RESPONSIBILITY

The statement of responsibility for the reclamation of the site (below) will be signed by Mitsubishi Cement Corporation's representative and will be included as a separate form.

I, the undersigned, hereby agree to accept full responsibility for reclamation of all mined lands as described and submitted herein and in conformance with the applicable requirements of Articles 1 and 9 (commencing with Sections 3500 et. seq. and 3700 et. seq., respectively) of Chapter 8 of Division 2 of Title 14 of the California Code of Regulations, the Surface Mining and Reclamation Act commencing with Section 2710 et. seq., and with any modifications requested by the administering agency as conditions of approval.

Signed this_____ day of _____, 20___ by:

Signature: _____Title: _____

Printed Name: _____

3.0 GEOLOGY

A full description of the site's geology is provided in the "Assessment of the Pit Slope Stability and Hydrologic Conditions" prepared by Golder Associates (August 2010) and included in Appendix C. The geology description is summarized below.

The vicinity and immediate surrounding areas are located within the Transverse Ranges geomorphic province of California. This province is marked by a general east-west trend of the nine major mountain ranges that in places have peak elevations that exceed 10,000 feet amsl. The province extends offshore to include San Miguel, Santa Rosa, and Santa Cruz Islands. Its eastern extension, the San Bernardino Mountains, has been displaced to the south along the active San Andreas Fault. Ongoing north-south compression results rapid uplift of many of the ranges within the province.

The Transverses Ranges contain some of the oldest rocks exposed within California. Within the San Bernardino Mountains, located east of the San Andreas Fault, five major groups of rocks are preserved:

- Metamorphosed crystalline and sedimentary rocks up to 1.7 billion years old. These rocks represent part of the ancient North American continent that has been faulted and folded, and uplifted along the now geologically active margin of modern North America.

- Metamorphosed metasedimetary rocks (metacarbonates and quartzites) that were deposited on the North American continental margin more than 300 million years ago. Deposition, burial, and faulting and folding have brought these rocks to the surface, particularly along the northern margin of the San Bernardino Mountains.

- Intrusive granitic rocks intruded into the North American continental margin during several stages of the Mesozoic Era from about 200 to 125 million years ago. A wide range of granitoid rocks have been mapped and dated, and they represent intrusion at both moderate and shallow depths within the ancient crust.

- Upper Cenozoic (less than about 20 million years ago), predominately terrestrial sedimentary rocks of conglomerate, sandstone mudstone and lake deposits. Generally only fragments of these units are preserved, and the sages and structural relations are unclear.

- Alluvial fans, lake, minor glacial and landslide deposits related to the present day landscape and ongoing erosion and deposition processes.

The present day structure of the San Bernardino Mountains is dominated by the San Andreas Fault along the southern boundary and the North Frontal Fault zone that marks its northern boundary. Ongoing movement of these faults results in uplift and eastward translation of the San Bernardino Mountains as a block, with apparently little internal deformation.

The proposed South Quarry will be located atop a broad (600 to 1,200 feet wide), east-west trending ridge that lies at an elevation between about 6,000 and 7,000 feet amsl. To the north, the ridge ends in a bluff and then a steep north-facing slope of almost 2,000 feet down to the active East Pit of the Cushenbury Mine site. To the south, the elevation continues upward to a broader low-relief area comprising Burnt Flats between about 6,700 and 7,000 feet amsl, then up a steep slope 500 to 600 feet to another lower relief area at an elevation of about 7,500 feet amsl. The proposed quarry area is drained by steep-gradient west- and north-draining ephemeral streams.

The proposed location of the quarry is sparsely vegetated with semi-arid species typical of the San Bernardino Mountains at these elevations. Abundant outcrops of fresh and slightly weathered metacarbonate rocks currently cover the location of the proposed quarry. No significant soil profile has developed, except in sheltered north-facing slopes where the density and variety of the vegetative cover increases.

The sequence of meta-sedimentary rocks located within the Proposed Project area consists of primarily metacarbonate rocks of the Paleozoic Bird Spring, Monte Cristo and Sultan Formations. These formations comprise rocks of Devonian to early Permian age (about 360 to 260 million years old) that were deposited as shallow-water limestone, and carbonaceous mudstone and sandstone on the western continental margin of North America. Although fragmented and disrupted by post-Paleozoic faulting, folding and igneous intrusion, this sequence of carbonate rocks is now preserved throughout much of Utah, Arizona, and the southern portions of Nevada and California. No structures were observed in the skarn that would adversely affect the stability of the proposed mine slopes.

4.0 HYDROLOGY

A description of the site's hydrology is provided in the "Assessment of the Pit Slope Stability and Hydrologic Conditions" prepared by Golder Associates (August 2010) and included in Appendix C. The hydrology description is summarized below.

Precipitation

The Lucerne Valley receives approximately 4 to 6 inches of precipitation a year, with the upper valley areas receiving approximately 6 to 8 inches a year (California Dept. of Water Resources, 2004). The Lucerne Valley weather station shows an average annual precipitation of 4.04 inches from September 1919 through September 1973, a total of 8,442 readings (Western Regional Climate Center, http://www.wrcc.dri.edu/). This weather station was located at an elevation of approximately 2,700 feet amsl, approximately 4,000 feet lower than the proposed quarry.

The Big Bear Lake weather station had an average annual precipitation of 21.52 inches from July 1960 through November 2009, a total of 17,432 readings (Western Regional Climate Center). This weather station is located at an elevation of approximately 6,670 feet amsl, comparable to the existing ground surface elevations of the proposed south quarry.

Based on the information from the Lucerne Valley and Big Bear Lake weather stations it is anticipated that the average annual precipitation received at the proposed South Quarry to be between 10 to 15 inches or approximately halfway between the two weather station records.

Groundwater

Mitsubishi's drill hole data within the footprint of the proposed South Quarry found no evidence of groundwater to a depth of 5,528 feet amsl. The existing East Pit, located to the north of the proposed South Quarry, has a floor elevation of 4,400 feet amsl, with no evidence of groundwater. The dry East Pit floor at 4,400 feet amsl demonstrates that the vertical separation between the proposed floor of the South Quarry (5,365 feet amsl) and the groundwater table will exceed 965 feet.

Surface Water

As shown on Sheet 2, the proposed South Quarry is located on top of and oriented along an existing mountain ridge. The layout of the Proposed South Quarry will prevent significant surface water run-on into the final pit. The effect of the proposed quarry on surface water run-off will be a net but minor decrease of surface water flowing into Marble Canyon as some of the run-off will be retained within the final developed quarry. This reduction in surface water run-off is anticipated to be relatively small.

The existing natural surface water drainages in the area of the proposed South Quarry are ephemeral and predominantly unvegetated. The principal channel that drains northwest into

Marble Canyon will be avoided by the planned South Quarry configuration. The existing surface water drainage patterns in the areas surrounding the proposed South Quarry will not be substantially altered as the entire quarry will be situated at the local topographic high. Due to the relatively small amount of average annual precipitation at the site, surface water that accumulates in the final quarry pit as the result of direct precipitation into the pit will likely evaporate, with minor percolation into the pit floor, and will result in minimal impact to the local groundwater conditions.

REFERENCES, ACRONYMS, AND GLOSSARY

REFERENCES

"Air Quality Study for Mitsubishi Cement Corporation's South Quarry", AMEC Geomatrix, Inc. July 2011.

"Assessment of Pit Slope Stability and Hydrologic Conditions", Golder Associates, July 2010.

"Biological Resource Assessment," Aspen Environmental Group, August 2010.

"Carbonate Habitat Management Strategy (CHMS)", San Bernardino National Forest Association, April 2003.

"Environmental Impact Report for the Cushenbury Mine Expansion", LSA and San Bernardino County, 2004.

"Jurisdictional Delineation Report for the South Quarry Expansion Project," Glenn Lukos Associates, June 2010.

"Land Management Plan, Part 2 San Bernardino National Forest Strategy" (USDA September 2005)

"Mine Reclamation Plan Cushenbury Mine," Mitsubishi Cement Corporation, December 2000.

"Potential Environmental Impacts to Nelson's Bighorn Sheep and Suggested Mitigation," Vernon C. Bleich, Eastern Sierra Center for Applied Population Ecology September 2010.

"Reclamation Compliance Report 2009" (for Cushenbury Mine), JJ Restoration Service, December 2009.

"Rules and Regulations," Mojave Desert Air Quality Management District, 2010.

"San Bernardino County General Plan," San Bernardino County (with updates).

"Surface Mining and Reclamation Act (SMARA)," California Department of Conservation, Office of Mine Reclamation, 2010.

ACRONYMS

amsl	above mean sea level
AQMP	Air Quality Management Plan
BACT	Best available control technology (for control of air emissions)
BATF&E	Bureau of Alcohol, Tobacco, Firearms and Explosives (federal agency)
BLM	Bureau of Land Management
BMP	Best Management Practices
Cal-OSHA	California Occupational Safety and Health Administration
CARB	California Air Resources Board
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CHMS	Carbonate Habitat Management Strategy
CNPS	California Native Plant Society
CUP	Conditional use permit
CUPA	Certified Unified Program Agency (The Hazardous Materials Division of the San Bernardino County Fire Department is designated as the "CUPA.")
CY	Cubic yards
DOC	Department of Conservation
EIR	Environmental Impact Report
FESA	Federal Endangered Species Act
H:V	horizontal to vertical; typically in feet (slope inclination)
MCC	Mitsubishi Cement Corporation
MCY	million cubic yards
MT	million tons
MTPY	million tons per year
NEPA	National Environmental Policy Act
NF	National Forest
NPDES	National Pollutant Discharge Elimination System
OMR	Office of Mine Reclamation
PM_{10}	10-micron or less particulate matter
RC	Rural Conservation (County zoning designation)
RWQCB	Regional Water Quality Control Board
SBNF	San Bernardino National Forest
SMARA	Surface Mining and Reclamation Act
SPCC	Spill Prevention, Control, and Counter-measure
SWPPP	Storm Water Pollution Prevention Program
WQMP	Water Quality Management Plan
USDA	United States Department of Agriculture
USGS	United States Geological Survey

GLOSSARY OF TERMS

BACT: Best Available Control Technology – Air quality term used to describe air pollutant control equipment for equipment and facilities that produce air emissions.

Bedrock: The solid rock that underlies soil and unconsolidated material.

Bench: Terrace or leveled area breaking the continuity of a slope. For the South Quarry, the bench will be 25 feet wide every 45 feet vertical feet.

Berm: An elongate earthen structure which acts as a barrier; e.g., to make it difficult for a vehicle or ORV to cross, or to redirect the flow of water.

California Endangered Species Act: California state legislation enacted in 1984, with the intent to protect floral (plant) and faunal (animal) species by listing them as "rare," "threatened" "endangered," or "candidate." The Act also provides a consultation process for the determination and resolution of potential adverse impacts to the species.

California Environmental Quality Act (CEQA): Policies enacted in 1970, and subsequently amended, the intent of which is the maintenance of a quality environment for the people of California now and in the future.

Carbonate Habitat Management Strategy (CHMS): An intensive collaborative effort led to the development of the Carbonate Habitat Management Strategy (CHMS) in 2003. The strategy is designed to provide long-term protection for the carbonate endemic plants and also provide for continued mining. Carbonate habitats are protected from mining impacts in perpetuity within the carbonate habitat reserves dedicated and managed as described in the CHMS. A Memorandum of Understanding and agreement was signed in 2003 by the USDA Forest Service, SBNF, Bureau of Land Management (BLM), San Bernardino County, Omya, Specialty Minerals, MCC, California Native Plant Society, and the Cushenbury Mine Trust stipulating that the signatories will implement the CHMS for the dual purpose of conserving threatened and endangered carbonate plants and streamlining mining operations.

Endangered species: A species whose prospects of survival and reproduction in the wild are in immediate jeopardy from one or more causes.

Environmental Impact Report (EIR): "Detailed statement or report prepared under CEQA describing and analyzing the significant effects of a project and discussing ways to mitigate or avoid the effects" (CEQA Guidelines §15362).

Factor of safety: Ratio of forces resisting slope or foundation failure over forces driving slope or foundation failure.

Fine Particulate Matter: Extremely small air pollutants less than 2.5 microns in diameter and that form primarily from engine combustion sources, not from fugitive dust sources ($PM_{2.5}$).

Growth Media: Surface material which contains nutrients, micro flora, and plant seeds.

Hazardous material: Substance, which may cause injury to persons or damage to property because of its potential for corrosivity, toxicity, ignitability, chemical reactivity, or explosiveness.

Haul road: A road used by haul trucks to haul ore and waste rock from the open pit to other locations usually to the crusher feed or to the waste rock stockpiles.

Hazardous material: Substance which, because of its potential for corrosivity, toxicity, ignitability, chemical reactivity, or explosiveness, may cause injury to persons or damage to property.

Hazardous waste: Defined in Section 1004(5) of the federal Resource Conservation and Recovery Act (RCRA) as, "…a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may: (a) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (b) pose a substantial present or potential hazard to human health or the environmental when improperly treated, stored, transported, or disposed of, or otherwise managed."

Hydrogeology: The study of surface and subsurface water.

Ore body: A generally continuous mass of ore distinct from the surrounding rock.

Phasing: Planned stages of project development.

Rare species: A species, which, although not presently threatened with extinction, is in such small numbers throughout its range that it may become endangered if its present environment worsens.

Reclamation: The combined process of land treatment that minimizes water degradation, air pollution, damage to aquatic or wildlife habitat, flooding, erosion, and other adverse effects from surface mining operations (SMARA 2007).

Reclamation Plan: A restoration plan for the stabilization and recovery of a mine site after cessation of mining operations for another use; generally open space or other low intensity use.

Revegetation: Establishment of native vegetation on lands that have been disturbed.

Regional Water Quality Control Board (RWQCB): Agency which administers the requirements of the California Administrative Code, Title 23, Division 3, Chapter 15 (Section 2595,g,7) to ensure the highest possible water quality consistent with all demands.

Sensitive species: A plant or animal species, which is recognized by the government or by a conservation group, as being depleted, rare, threatened, or endangered.

Threatened Species: Species, which, although not presently threatened with extinction, are likely to become endangered in the foreseeable future in the absence of special protection and management efforts.

Waste Rock: Limestone which does not meet cement quality specifications and other rock types encountered during excavations which will be pushed or hauled directly to two planned waste rock stockpiles located within the southeast portion of the South Quarry.

Water table: The upper water level of a body of groundwater.